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SPECTRUM MANAGEMENT

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This instruction implements guidance and procedures for Air Force-wide management and use of the electromagnetic spectrum and implements Department of Defense Instruction (DoDI) 4650.01, *Policy and Procedures for Management and Use of the Electromagnetic Spectrum*; DoDI 8320.05, *Electromagnetic Spectrum Data Sharing*; National Telecommunications and Information Administration *Manual of Regulations and Procedures for Federal Radio Frequency Management* (hereafter "NTIA Manual"); Air Force Policy Directive (AFPD) 33-5, *Warfighting Integration*; and the procedures established by the Joint Staff J65A United States Military Command, Control, Communications, and Computers Executive Board (MC4EB). It identifies various levels of responsibilities for Air Force (AF) management and use of the electromagnetic spectrum (EMS) and provides procedures for implementation. This publication applies to the Regular Air Force and equally to the Air Force Reserve (AFR), Air National Guard (ANG), and Civil Air Patrol (CAP) developing, operating, or supporting under Title 10; or General Schedule employee operating, developing, or supporting spectrum dependent (SD) equipment under Title 5; and contractors operating, developing, or supporting SD equipment in support of AF activities. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, Table 1.1 for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. Refer recommended changes and technical questions about this publication to the Air Force Spectrum Management Office (AFSMO/SQ), 6910 Cooper Avenue, Fort Meade, MD 20755-7088, using AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 through the appropriate functional chain of command. This publication may

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SUMMARY OF CHANGES

This document has been renumbered and substantially revised, and must be completely reviewed. Major changes include the addition of the following spectrum guidance and policy updates contained in Attachment 9, Air Force - DoD Area Frequency Coordinators for National and Service Test and Training Ranges and in Attachment 10, Spectrum Support for Air Force Sponsored Exercises.

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1. Overview.

1.1. Managing the Radio Frequency (RF) Spectrum. International law, domestic law, and implementing regulations require effective and efficient use of the EMS. Effective and efficient use is defined as applying design or operational techniques that conservatively use of the EMS in a compatible (i.e. non-interference) manner.

1.2. Allocation. The EMS is allocated between federal and non-federal users with portions of the spectrum shared. Federal users must utilize frequency bands allocated for government or shared use. A government frequency assignment may be authorized in a non- government band provided the request is coordinated and granted approval by the Federal Communications Commission (FCC).

1.3. International Spectrum Management. The International Telecommunications Union (ITU) is the body responsible for international frequency allocations, worldwide telecommunications standards, and telecommunications development activities.

1.3.1. ITU Membership. The United States (US) is a member of the ITU. The legal framework of the ITU consists of the ITU Constitution and Convention, along with the administrative regulations that complement the Constitution and Convention; these documents have treaty status and are binding on ITU members.

1.3.2. Host Nation (HN) Approval. Sovereign nations exercise control over the use of the EMS within their own territory. This basic consideration of international spectrum management becomes extremely important when US military forces operate abroad. In nearly all circumstances, it is necessary to obtain HN approval for frequency use before US forces can legally operate any SD equipment in a foreign nation. Failure to obtain HN approval has many serious consequences, including a lack of protection from interference and potential violation of international and local laws (which could lead to fines, seizures of equipment, and ultimately could potentially cause an international incident).

2. Roles and Responsibilities.

2.1. Authority.

2.1.1. US National Spectrum Management. Title 47 United States Code (USC), 151 et seq., *The Communications Act of 1934*, (47 USC 151) established separate control of federal (government) and non-federal (civilian) use of the EMS. The National Telecommunications and Information Administration (NTIA) Organization Act (47 USC 901, et seq.), codified the NTIA's role as the agency responsible for federal spectrum management. Non-federal spectrum use is controlled by the FCC. Under this act, the only government agencies that assign and control the use of frequencies in the US are the NTIA and the FCC.

2.2. Organizations.

2.2.1. NTIA. The NTIA assigns and regulates frequencies for all federal users within the United States and its Possessions (US&P). The NTIA governs all federal (including DoD) use of the EMS through the *NTIA Manual*.

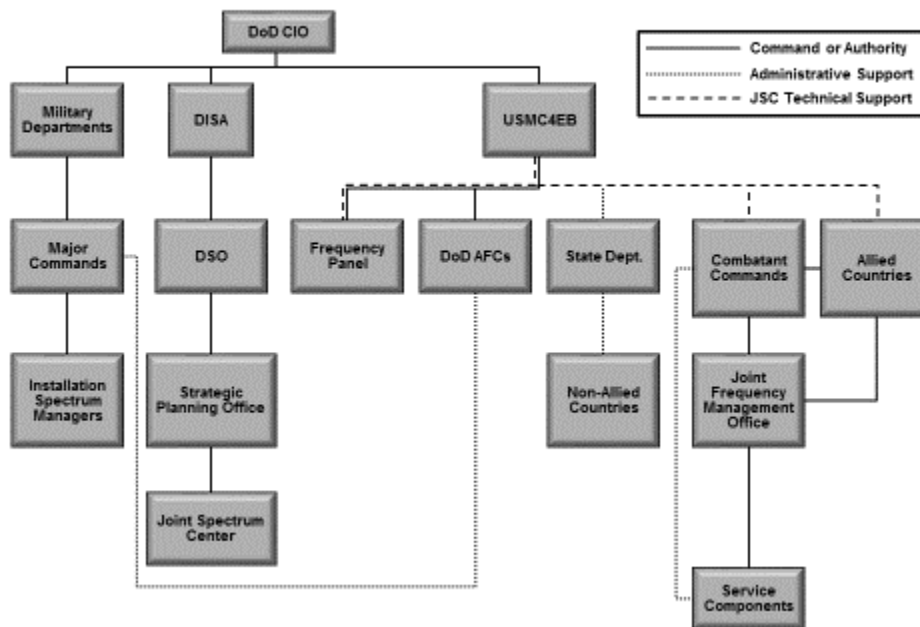
2.2.2. FCC. The FCC assigns and regulates frequencies for non-federal users within the US&P. Non-federal users include private citizens, companies, and state and local government users.

2.2.3. Department of Defense (DoD) Spectrum Management. The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD [AT&L]) sets policy for acquiring systems utilizing the EMS and ensures compliance with EMS support procedures. The DoD Chief Information Officer (DoD CIO) develops overall DoD policy for managing and using the EMS. DoD activities involved in frequency management (see Figure 1.) are:

2.2.3.1. US Military Command, Control, Communications, and Computers Executive Board (USMC4EB). The USMC4EB, or hereafter “MC4EB”, develops joint policy and provides direction in military communications-electronics (C-E) matters.

2.2.3.2. The MC4EB Joint Frequency Panel (JFP). The MC4EB JFP provides expert technical advice to the MC4EB in the areas of RF engineering and EMS management. Through the Equipment Spectrum Guidance Permanent Working Group (ESG PWG), it reviews the characteristics of major C-E equipment purchased or developed by the DoD. This is known as the Joint Frequency Equipment Allocation Process (also called the J/F-12 Process) and is defined by requirements established by the NTIA, Interdepartmental Radio Advisory Committee (IRAC), Spectrum Planning Subcommittee (SPS), and military joint or allied system review groups. The MC4EB, through the Frequency Panel’s (FP) Spectrum Operations Permanent Working Group (SOPWG), establishes procedures for submitting frequency assignment requests according to requirements established by the NTIA, IRAC, Frequency Assignment Subcommittee (FAS), and military joint or allied frequency assignment groups.

Figure 1. DoD Spectrum Management.



2.2.3.3. DoD Area Frequency Coordinator (AFC). The DoD AFCs are responsible for ensuring successful frequency coordination in the areas that lie within, are

adjacent to, or are within radio line-of-sight (LOS) to any range spectrum dependent system, including all systems brought to a national test range or other designated complex. Activities must coordinate all military frequency use within a DoD AFC area of responsibility (AOR) with the appropriate DoD AFC before starting operations. Attachment 9 details the responsibilities of the AF sponsored DoD AFCs. DoD AFCs obtain administrative support directly from their parent major command (MAJCOM) and to the MC4EB for policy guidance. The Allied Communications Publication (ACP) 190 (US SUPP-1(D), *Guide to Frequency Planning*, contains specific policy guidance. Refer to the NTIA Manual, Annex D, Table 3, Section 8.3.26, and Table 8.3.26 for a list of the DoD AFC geographic descriptions, addresses, and phone numbers.

2.2.3.4. Defense Information Systems Agency (DISA). A Combat Support Agency, engineers and provides command and control capabilities and enterprise infrastructure to continuously operate and assure a global net-centric enterprise in direct support to joint warfighters, national level leaders, and other mission and coalition partners across the full spectrum of operations.

2.2.3.4.1. Defense Spectrum Organization (DSO). The DSO is the center of excellence for EMS analysis and the development of integrated spectrum plans and long-term strategies to address current and future needs for DoD spectrum access. DSO provides direct operational support to the Chairman of the Joint Chiefs of Staff, Combatant Commanders, Secretaries of Military Departments, and Directors of Defense Agencies to achieve national security and military objectives.

2.2.3.4.1.1. Joint Spectrum Center (JSC). The JSC is a field office of the DSO and supports the Combatant Commands (CCMD), services, and agencies by providing spectrum planning guidance, system integration, system vulnerabilities and analysis, environmental analysis, test/measurement support, operational support, spectrum management software development, spectrum certification support, and maintains the DoD Frequency Resource Records System (FRRS) and Joint Spectrum Interference Resolution (JSIR) database.

2.2.3.4.1.2. Strategic Planning Office (SPO). The SPO is responsible for developing comprehensive and integrated spectrum planning and long-term strategies for DoD spectrum access. The SPO is the DoD focal point for participation in national spectrum issues, international spectrum coordination, and for pursuing emerging spectrum efficiency technologies in DoD acquisitions. The purpose of the SPO is to maximize global spectrum access for US forces both now and for the future.

2.2.3.5. CCMD Joint Frequency Management Office (JFMO). All outside Continental United States (OCONUS) frequency requirements must be submitted to the appropriate JFMO, after obtaining coordination with the appropriate AF component SMO. The JFMO coordinates all HN spectrum certifications: no SD equipment will be operated in the CCMD's AOR without JFMO/HN approval.

2.2.3.6. Military Department Spectrum Management Offices (SMO). There are three offices responsible for carrying out spectrum policy within the military services, the US Army SMO (ASMO), the Navy/Marine Corps Spectrum Center (NMSC), and AFSMO.

3. Air Force Spectrum Management.

3.1. AF Spectrum Management. Chief, Information Dominance and Chief Information Officer, (SAF/CIO A6) is the senior AF officer responsible for EMS management. SAF/CIO A6 sets policy for managing EMS use to support the AF mission and exercises control over the frequency management process.

3.2. AFSMO Roles and Responsibilities. Commander, Air Force Spectrum Management Office (AFSMO) represents the AF spectrum user at the national level. AFSMO processes frequency requests through NTIA for use within the US&P while performing these additional roles.

3.2.1.1. In coordination with SAF/A6, carry out AF EMS management policy.

3.2.1.2. Evaluate AF plans for needed EMS support.

3.2.1.3. Represent and defend AF EMS technical interests in committees, groups, and organizations that address EMS management matters.

3.2.1.4. Negotiate at the departmental, national, and international levels to obtain frequency allocations and assignments to satisfy AF exercises, crises, contingencies, wartime, and day-to-day RF requirements for use of the spectrum.

3.2.1.5. Provide administrative guidance to AF sponsored DoD AFCs.

3.2.1.6. Assist in resolution of interference problems involving AF assigned frequencies.

3.2.1.7. Provide guidance through appropriate command channels on EMS to developers and users of all AF systems that requires EMS access or whose performance can be influenced by RF energy. This includes communications and information systems, electronic warfare (EW) operations, intelligence and weapons systems, commercial-off-the-shelf (COTS) equipment, and any other equipment that relies on the EMS.

3.2.1.8. Conduct staff assistance visits (SAVs), upon Wing Commander's request, to ensure the Air Force broadly, and subordinate units specifically are meeting compliance with national procedures and policy for federal radio frequency management.

3.2.1.9. Evaluate and determine the impact of EM SD systems on current or planned operational use of the EMS.

3.2.1.10. Provide assistance to AF activities requiring JSC services.

3.2.1.11. Assist AF activities in obtaining frequency services.

3.2.1.12. Provide curriculum input and support to the EMS Management Course and the Joint Task Force (JTF) Spectrum Management Course under the Air Education and Training Command (AETC).

3.2.1.13. In coordination with SAF/A6, provide spectrum management support to the following commands (US Transportation Command, US Strategic Command, US Cyber Command, US Central Command, US Element NORAD, US Northern Command, and US Special Operations Command) IAW DoDD 5100.03, *Support of the Headquarters of Combatant and Subordinate Unified Command*.

3.2.1.14. Develop, coordinate and publish an inspection checklist within six months of publication of this instruction (MICT) and response to comments related to Air Force Instruction as required.

3.2.2. MAJCOM Spectrum Management Responsibilities. Each MAJCOM Spectrum Manager will:

3.2.2.1. Carries out AF policy, practices, and procedures for managing the use of the EMS.

3.2.2.2. Ensures compliance with the NTIA frequency assignment review program as outlined in para 5.10 and Attachment 7. Is actively involved in communications/information planning and assists in coordinating and obtaining frequency support to meet the MAJCOM mission. (T-0)

3.2.2.3. Ensures incorporation of wartime and contingency EMS management procedures into the appropriate operation plan/contingency plan appendices.

3.2.2.4. Provides EMS guidance to the MAJCOM acquisition, logistics, intelligence, operations, and communications planning staffs.

3.2.2.5. Manages EMS use in the concept, planning, deployment, operation, and evaluation phases of MAJCOM supported exercises and operations.

3.2.2.6. Processes and obtains frequency assignments and allocations for SD systems in support of operational requirements.

3.2.2.7. Provides guidance on using the EMS early in the concept, exploration, demonstration, and validation phases of the acquisition process.

3.2.2.8. Ensures coordination with the appropriate agencies like (DoD AFCs, etc.) is accomplished prior to frequency assignment.

3.2.2.9. Reviews the subordinate unit EMS management programs.

3.2.2.10. Performs SAVs and emitter surveys upon Wing Commander's request. SAVs and emitter surveys are tools to assist subordinate spectrum managers and spectrum users in understanding spectrum management procedures and policies, and ensure radio frequency assignments are validated and current.

3.2.2.11. Helps organizations ensure there is no degradation of friendly systems or operations during command, control, and communications countermeasures training activities.

3.2.2.12. Ensures subordinate spectrum management entities (Numbered AF [NAF], Wing, Center, Installation Spectrum Manager [ISM], etc.) provide appropriate spectrum management support and guidance to users.

- 3.2.2.13. Provides subordinate spectrum managers with the necessary spectrum management training required to perform assigned spectrum duties. (T-2)
 - 3.2.2.14. Ensures subordinate spectrum managers have current spectrum data.
 - 3.2.2.15. Provides AFSMO with curriculum input recommendations for the Spectrum Operations Apprentice Course and the JTF Spectrum Management Course.
 - 3.2.2.16. Provides assistance to MAJCOM IG in inspecting subordinate units or activities. Helps ensure Critical Compliance Items (CCI) are identified and complied with when accomplishing self-inspections and compliance inspections.
 - 3.2.2.17. Ensures all SD equipment employed during MAJCOM sponsored exercises, including foreign military systems, have approved frequency assignments from a cognizant authority.
 - 3.2.2.18. Compile all components of the exercise package as identified in Attachment 10.
 - 3.2.2.19. Provide AFSMO with a schedule of planned exercises annually to include dates, times and locations of related planning conferences
 - 3.2.2.20. Provides quality control and updates to MAJCOM frequency records in the FRRS.
 - 3.2.2.21. Assist in the reporting and resolution of interference events involving assigned frequencies.
- 3.2.3. Numbered Air Force SMO Responsibilities. Each NAF spectrum manager carries out Air Force policy, practices, and procedures for managing use of the EMS. NAF spectrum managers will:
- 3.2.3.1. Be actively involved in communications and information planning, and assists in coordinating and obtaining frequency support to meet the MAJCOM, Air Component, and/or CCMD mission.
 - 3.2.3.2. Provide MAJCOM RF spectrum guidance to the NAF planning staff, including logistics, intelligence, operations, communications, and subordinate units.
 - 3.2.3.3. Consider and coordinate RF spectrum use during the conceptual, planning, deployment, operation, and evaluation phases of exercises and operations.
 - 3.2.3.4. Obtain frequency assignments and allotments for SD systems as directed by the NAF and/or Air Component Commander, MAJCOM or CCMD in support of exercises, contingencies, or wartime operational requirements. (T-3)
 - 3.2.3.4.1. Ensure all frequency requirements and allotment requests for operations within the US&P are coordinated with the appropriate DoD AFC, MAJCOM, and/or Service spectrum management office with jurisdiction in the proposed area of use IAW procedures outlined in para 5.
 - 3.2.3.4.2. Ensure all frequency requirements and allotment requests for operations outside the US&P are coordinated with the appropriate CCMD JFMO IAW procedures outlined in para 5.1, as applicable, and CJCSI 3320.01, *Joint Electromagnetic Spectrum Operations in the Electromagnetic Operational*

Environment (Series).

- 3.2.3.5. Maintain current editions of the frequency management publications applicable to the NAF AOR.
- 3.2.3.6. Maintain an accurate SPECTRUM XXI (SXXI) database of all frequency assignments within the NAF AOR.
- 3.2.3.7. Ensure frequency assignments under NAF control are reviewed according to guidance provided in para 5.10 and Attachment 7.
- 3.2.4. Subordinate Unit Spectrum Manager Responsibilities. Spectrum Managers assigned to MAJCOM subordinate units; i.e. Wings, AF Test and Training Ranges, Groups, etc., will:
 - 3.2.4.1. Carry out AF policy, practices, and procedures for managing the use of the EMS within their AOR.
 - 3.2.4.2. Assist organizations and users within their control in communications/information planning, coordinating, and obtaining frequency support to meet the mission.
 - 3.2.4.3. Ensure contingency EMS management procedures are placed in operational and contingency plans and appendices as appropriate.
 - 3.2.4.4. Provide EMS guidance to users in acquisition, logistics, intelligence, operations, and communications planning staffs.
 - 3.2.4.5. Manage EMS use in the concept, planning, deployment, operation, and evaluation phases of Wing, DoD Range, Group, or Squadron supported exercises and operations under their control.
 - 3.2.4.6. Provide guidance to users (program/project offices) of the EMS early in the concept, exploration, demonstration, and validation phases of the acquisition process. (T-3)
 - 3.2.4.7. Review and update frequency assignment records under control of the Wing, DoD Range, Group, or Squadron AORs IAW guidance found in Attachment 7. 0)
- 3.2.5. Host Installation Responsibilities.
 - 3.2.5.1. Host installation commanders or directors are responsible for all EM radiation emanating from their installation and from those outlying activities hosted by the installation.
 - 3.2.5.2. Host installation commanders or directors will:
 - 3.2.5.2.1. Ensure a viable spectrum management program for the installation and outlying areas (e.g. ranges) is in place and supports installation requirements. The installation commander/director is responsible for the operational de-confliction of all spectrum-dependent assets under their purview and can prohibit any RF emitter from operating (cease and desist) when anticipating or resolving interference to mission essential EM equipment. (T-0)
 - 3.2.5.2.2. Identify a full time 3D1X4 Spectrum Operations military or civilian

manager and appoint in writing, a primary and alternate spectrum manager to organize and carry out the spectrum management program and notify the appropriate MAJCOM or cognizant Service SMO. Review program and appointments annually. (T-2)

3.2.5.2.3. Ensures hosted spectrum-dependent systems comply with all applicable spectrum policy and guidance.

3.2.5.2.4. Ensure spectrum is considered as part of installation encroachment considerations IAW AFI 90-2001, *Encroachment Management*.

3.2.5.2.5. Ensure procedures are in place to address requests for access to facilities for commercial SD systems as described in para 6.55 and AFI 32-9003, *Granting Temporary Use of Air Force Real Property*.

3.2.5.2.6. Ensure compliance with the requirements of the Frequency Assignment Review Program described in para 5.10 and Attachment 7.

3.2.6. Installation Communications Commander or Director Responsibilities. Installation Communications commanders or directors will:

3.2.6.1. Ensure the ISM serves a minimum of 12 months in the position unless mission requirements dictate otherwise.

3.2.6.2. Ensure the ISM acquires and maintains the necessary spectrum management training to accomplish required duties.

3.2.6.3. Ensure the ISM has or is able to attain at a minimum, SECRET security clearance required to perform spectrum management duties.

3.2.6.4. Ensure the ISM has Secret Internet Protocol Router Network (SIPRNET) access.

3.2.7. Installation Spectrum Manager Responsibilities. The ISM will:

3.2.7.1. Ensure using activities understand the parameters of their assigned frequencies. (T-2)

3.2.7.2. Maintain current frequency management records of all frequencies assigned to the installation and outlying activities hosted by the installation and provide using activities with Radio Frequency Authorization (RFA) for their records. (T-2)

3.2.7.3. Meet with all using activities annually to conduct customer education and discuss current spectrum management issues.

3.2.7.4. Process frequency proposals and applications for equipment certification (DD Form 1494 and EL CID files, and ensure submission through the appropriate command channels. (T-0)

3.2.7.5. Review local purchase orders for SD systems through contracting offices or government credit cards to evaluate spectrum supportability prior to the obligation of funds; particularly if the system will be deployed OCONUS.

3.2.7.6. Provide spectrum management assistance and guidance to host installation and tenant activities.

- 3.2.7.7. Support exercise coordination requirements IAW Attachment 10.
- 3.2.7.8. Review installation operation plans and requirements documents, and obtain frequency support through command channels. Additionally, ISMs must regularly:
 - 3.2.7.8.1. Assist local deployable units to identify spectrum requirements for upcoming exercises and contingencies.
 - 3.2.7.8.2. Coordinate with installation planning offices to obtain information about SD equipment. Provide guidance and recommendations for the most efficient use of the spectrum.
- 3.2.7.9. Ensure contractor activities using AF frequencies to support AF requirements follow AF policies for EMS use, per para 5.7.
- 3.2.7.10. In cooperation with using activities, verify frequency assignment requirements, validate existing frequency assignment parameters, and submit appropriate modifications, renewal, or deletion actions through the appropriate MAJCOM.
- 3.2.7.11. Be responsible for updating and maintaining their records in the FRRS.
- 3.2.7.12. Draft spectrum management portion of any memorandum of understanding (MOU) or memorandum of agreement (MOA) and maintain a copy.
- 3.2.7.13. Maintain a current point of contact (POC) listing (name, unit, e-mail address, and phone number) for all using activities. This listing will be updated annually at a minimum. (T-3)
- 3.2.7.14. Write and publish installation instructions or supplements to this instruction, as needed. Draft copies should be sent to the parent MAJCOM for review before publishing. Once published, a copy of the final publication should be sent to the MAJCOM and kept on file as long as it is valid. (T-3)
- 3.2.7.15. Educate using activities, program/project offices, etc. on the importance of obtaining spectrum supportability guidance and validation prior to entering into a contractual obligation for all EM SD systems.
- 3.2.7.16. Perform emitter surveys with assistance from the MAJCOM if necessary, in conjunction with ongoing efforts to comply with the requirements of the NTIA Frequency Assignment Review Program described in para 5.10 and Attachment 7. (T-0)
- 3.2.7.17. Coordinate with HQ FAA and DoD AFCs on aeronautical radionavigation spectrum matters IAW guidance found in Attachment 8.
- 3.2.7.18. Coordinate new requirements, as appropriate, with DoD AFCs.
- 3.2.7.19. Immediately upon notification of interference on the installation, notify the cognizant AFC and request assistance as necessary, initiate full investigation to locate and terminate the offending source. Report interference as prescribed in AFI 17-221, *Spectrum Interference Resolution Program*. (T-2).
- 3.2.7.20. Coordinate with installation Safety Office and Weapons Safety Officer to support the hazard of electromagnetic radiation to ordnance program and provide

frequency assignment records, as requested for antenna locations, see AFI 91-208, *Hazards of Electromagnetic Radiation to Ordnance (HERO) Certification and Management*. (T-2).

3.2.7.20.1. Provide parametric data for each SD emitter to include the frequency/band, emitter power and type, antenna gain, and location. For pulse-modulated systems, also provide the duty cycle, the pulse width, and pulse repetition frequency.

3.2.7.20.2. Ensure coordination is accomplished between the using unit and safety office prior to relocating SD emitters or changing frequency(ies), antenna gain, and/or power characteristics of existing frequency assignments.

3.2.7.21. Perform Joint Base spectrum duties as listed in para 5.9 when appointed.

3.2.8. Using Activities Responsibilities. Using activities to include but not limited to; Program/Project/Acquisition Offices, Operating Units, Test Organizations, Tenant Units, etc., will:

3.2.8.1. Ensure the appropriate spectrum certification and supportability requirements are met prior to purchasing any RF equipment or entering into any contractual obligations involving the use of RF dependent devices IAW guidance provided in the NTIA Manual, Section 10.1.2, satisfying OMB Circular A-11. This includes providing correct technical data for systems not otherwise directed by higher level organizations. (T-0)

3.2.8.2. Obtain a frequency assignment through the ISM prior to operation of any SD devices that radiates RF energy. (T-0)

3.2.8.3. Maintain a copy of frequency authorizations received from the ISM.

3.2.8.4. Request the minimum number of frequencies necessary to accomplish the mission.

3.2.8.5. Request the minimum transmitter power and antenna gain/height necessary to ensure adequate coverage.

3.2.8.6. Ensure EM radiating equipment operations comply with authorized parameters identified in the frequency assignment notification. (T-0)

3.2.8.7. Act promptly to notify the ISM to report and assist in resolving incidents of interference IAW to AFI 17-221.

3.2.8.8. Use radiation-suppression devices (dummy loads) as much as possible when tuning, testing, or experimenting with any equipment that emits radio frequencies.

3.2.8.9. Provide in writing to the ISM or responsible spectrum management office the name, e-mail address, and phone number of a POC for unit frequency matters and provide updated information immediately when the POC information changes.

3.2.8.10. Immediately notify the ISM in writing when frequencies are no longer required.

- 3.2.8.11. Obtain approval through the ISM before modifying any existing emitters or antennas (i.e., increase power, change antenna height or gain), if outside of the assigned parameters of the frequency authorization.
 - 3.2.8.12. Assist the ISM in reviewing and verifying equipment parameters during mandatory and periodic reviews, refer to para 5.10 and Attachment 7.
 - 3.2.8.13. Contact the ISM for interpretation or guidance of any spectrum management policy.
 - 3.2.8.14. Acquisition activities will complete and maintain spectrum certification (i.e. DD Form 1494 and EL CID file) and Spectrum Supportability Risk Assessments for all assigned systems IAW guidance provided in Attachment 2 and 5 of this instruction. (T-0)
 - 3.2.8.15. Acquisition activities and units will submit HN Coordination Package request to the MAJCOM, as necessary per Attachment 4.
- 3.3. Air Force Chief of Safety and Air Force Safety Center (AFSEC).
- 3.3.1. AFSEC develops, implements, executes, and evaluates Air Force aviation, ground, weapons, space and system mishap prevention and nuclear surety programs and policies, and is responsible for the implementation, certification, and management of the Air Force HERO and Weapon System Safety and Explosive Safety Programs.
 - 3.3.2. AF Chief of Safety will:
 - 3.3.2.1. Establish criteria and guidance to ensure future designs are safe from electromagnetic radiation (EMR) hazards.
 - 3.3.2.2. Establish and maintain procedures for HERO certification of ordnance and promulgate these procedures to the Air Force.
 - 3.3.2.3. HERO. The HERO program encompasses the establishment and implementation of explosives safety standards, criteria, instructions, regulations, and electromagnetic emission control procedures of EMR emitters throughout the Air Force. Procedures for HERO certification and management are found in AFI 91-208, Hazards of Electromagnetic Radiation to Ordnance (HERO) Certification and Management.

4. Spectrum Certification.

- 4.1. Process and Guidance. Spectrum certification is the statutory process whereby national regulatory bodies – NTIA and FCC for the U.S., review telecommunications systems for frequency availability, electromagnetic compatibility (EMC), and telecommunications service priority. This process, often referred to as equipment certification, is required for all RF transmitters including COTS and non-developmental items, unless specifically exempt. See Attachment 3 for more details on exemptions. The successful completion of the certification process allows users to request radio frequency assignment for each discrete frequency for certified systems.
 - 4.1.1. IAW DoDI 4650.01, Policy and Procedures for Management and Use of the Electromagnetic Spectrum, para 4.d.; and OMB Circular A-11, section 31.12; all using activities, system developers, PMOs, and/or acquisition activities are required to obtain

spectrum guidance before submitting estimates for the development or procurement of major SD systems (including systems employing space satellite techniques). (T-0)

4.1.2. While local purchases of SD systems through contracting offices or government credit cards may not require U.S. national regulatory coordination, they must be reviewed by the appropriate spectrum management office to evaluate spectrum supportability prior to the obligation of funds; particularly if the system will be deployed OCONUS.

4.1.3. All SD systems must meet EMC standards IAW para 4.3.2.

4.2. Allocation Tables. Frequency allocation tables (NTIA Manual, [Chapter 4](#)) provide the guidance for general EMS use both nationally and internationally (each nation that manages their RF resources has a national table). The allocation tables delineate proper use of the spectrum by the type of service (i.e., fixed service, aeronautical mobile service, etc.). Every effort should be made to ensure equipment design and use of the EMS by the system is IAW the allocation tables (e.g., planned frequency use matches preexisting station classes in those bands). Specific exemptions can be made for operation outside of designated bands providing that the system be coordinated with the appropriate governing body and proof that the system will cause no harmful interference. Use of non-federal bands must be justified (beyond cost and convenience) and assessed to guarantee non-interference to the current and future systems operating in that band. Justification consists of two parts: 1) why the non-allocated frequencies are needed in the first place; and 2) how the system will operate in the requested band(s) without causing harmful interference to systems operating in established services.

4.2.1. Out-of-Band Operations.

4.2.1.1. Within the continental United States (CONUS). If an out-of-band justification is accepted by the NTIA for the system, system certification and use will be on a strict non-interference basis (NIB), not only to systems presently operating in the established services, but to any future systems operating in established services that may be certified at some later date. Systems that do not comply with the US Table of Frequency Allocations, with an out-of-band justification acceptable to NTIA, may be permitted to operate on an unprotected, NIB. Lacking such justification, programs should not expect NTIA certification for such non-compliant systems.

4.2.1.2. Outside the continental United States. Out-of-band justifications are host nation dependent and are coordinated via the CCMD responsible for that region or area of operation.

4.3. Electromagnetic Environmental Effects (E3). E3 consists of the specialized areas of EMC, EMI, electromagnetic pulse (EMP), electromagnetic vulnerability, lightning, radiation hazards (RADHAZ), precipitation static, and electrostatic discharge. Consideration of all these various aspects of E3 are crucial to fielding Air Force systems that are electromagnetically compatible with each other and the surrounding systems that must operate in the electromagnetic environment (EME). AF agencies and organizations developing, procuring, or modifying equipment using the EMS must do everything possible to meet applicable international, national, military, and HN EMC standards. Noncompliance may result in the denial of frequency authorization or severe operational restrictions.

4.3.1. National EMC. The NTIA establishes EMC standards for all SD systems operating within the U.S. and its territories and publishes these standards in the NTIA Manual. Penalties for nonconformance are described in **Chapter 5**, section 5.1.2, “Consequences of non-conformance with the Provisions of this Chapter”. However, in certain limited cases where compliance is not technically possible, a temporary waiver may be granted. All waiver requests should be routed through appropriate program and spectrum management channels to the AFSMO, Spectrum Certification Division (AFSMO/SQC) for further review and consideration at the NTIA. All waiver submissions must contain evidence that the SD system is non-compliant with NTIA EMC technical standards and will not cause unintended or harmful electromagnetic spectrum interference (EMI). A waiver of EMC standards does not constitute authorization to operate.

4.3.1.1. DoD EMC. DoDI 3222.03, *DoD Electromagnetic Environmental Effects (E3) Program*, establishes policy and responsibility for the management and implementation of the DoD's EMC and E3 Program, to ensure operational EMC and effective E3 control for all electronic and electrical systems, subsystems, and equipment developed, acquired, and operated by the DoD Components. Additionally, DoDI 4650.01, *Policy and Procedures for Management and Use of the Electromagnetic Spectrum* provides policy and guidance that directs DoD Components' spectrum-dependent system developers to assess EMC through a Spectrum Supportability Risk Assessment (SSRA); enclosure 3, para 2. Note: Additional information on the AF SSRA process is provided in Attachment 5.

4.3.1.2. DoD EMC Standards. Military-Standard-464 (MIL-STD-464), *Electromagnetic Environmental Effects Requirements for Systems* provides important EMC and E3 standards for DoD SD systems. All Air Force SD programs shall conform to MIL-STD-464.

4.3.2. Hazards of Electromagnetic Radiation. SD systems leverage electromagnetic waves of radiant energy; called spectrum, to carry data, voice, and other information from one place to another as the energy propagates through space. In some cases, such as radar and x-rays, we use the electromagnetic waves themselves as information. An electromagnetic wave has both electrical and magnetic field components, which oscillate in a fixed relationship to one another, perpendicular to each other and perpendicular to the direction of energy and wave propagation. Depending on the level of energy and the frequency of the oscillation, these waves can present harmful effects when in contact with certain reactive materials like fuels, weapon systems, electrical components, and even humans. Collectively, this phenomenon is referred to as Hazards of Electromagnetic Radiation and all SD system developers must ensure compliance with appropriate DoD, national, and applicable host nation EMC requirements as part of the equipment certification and SSRA processes. DoDI 3222.03, *DoD Electromagnetic Environmental Effects (E3) Program*, directs DoD Components' spectrum-dependent system developers, to mitigate the following primary EM radiation hazards:

4.3.2.1. Hazards of Electromagnetic Radiation to Ordnance (HERO). Military-Handbook-240 (MIL-HDBK-240), *Hazards of Electromagnetic Radiation to Ordnance (HERO) Test Guide*, describes HERO as a situation in which exposure of ordnance to external electromagnetic environments (EMEs) results in specific safety

or reliability margins of electrically initiated devices (EIDs) or electrically powered ordnance firing circuits to be exceeded, or EIDs to be inadvertently actuated.

4.3.2.2. Hazards of Electromagnetic Radiation to Fuel (HERF). HERF occurs when EM radiation creates electrical currents strong enough to create electrical arcs (sparks) when an induced voltage exceeds the breakdown voltage or flashpoint of a surrounding medium. These sparks can then ignite the fuel possibly leading to an explosion. Air Force Safety (AF/SE) and the Air Force Safety Center (AFSEC) establishes and implements policy and inspection standards, in conjunction with SAF/CIO A6, for safety programs associated with the non-biological hazards of EMF-producing systems and equipment, e.g., HERO, HERF.

4.3.2.3. Hazards of Electromagnetic Radiation to Personnel (HERP). HERP is a situation in which exposure to electromagnetic radiation causes harm to personnel. Typically, adverse biological effects of non-ionizing (electromagnetic) radiation are thermal, resulting from overheating of human body tissue. Overheating results when the body is unable to cope with or adequately dissipate heat generated by exposure to RF energy. AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program* provides minimum occupational health requirements for an EMF health surveillance program, provides minimum occupational health requirements, for an EMF health surveillance program IAW DoDI 6055.11, *Protecting Personnel from Electromagnetic Fields*, requiring personnel hazard to be addressed as part of the Air Force acquisition lifecycle.

4.3.2.4. AFI 91-208, *HERO Certification and Management*, and AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, provides Air Force HERO and HERF guidance, while DoDI 6055.11, provides for HERP, and should be consulted as part of initial spectrum-dependent system development and acquisition. Compliance with these instructions is mandatory.

4.3.3. HN EMC Standards. HN authorities consider HN EMC standards during the DD Form 1494 coordination process.

4.3.3.1. Application for Equipment Frequency Allocation – “Spectrum Certification”. A principal goal of the DoD’s SM program is to develop and efficiently manage the DoD’s use of the spectrum during the frequency allocation, allotment, and assignment processes. Achieving this goal minimizes the potential for interference during the fielding and employment of SD equipment in its intended operational environment. The spectrum certification and supportability process supports the DoD’s SM goal and is a critical factor due to significant increases in the complexity and use of limited electromagnetic spectrum.

4.3.3.2. The application process is closely aligned with the four stages of the DoD acquisition milestones, where the equipment or system program office (PO) completes the DD Form 1494 and an EL CID file with radio frequency data for each stage of a systems acquisition lifecycle as it matures from the conceptual through to the operational stage of development.

4.4. HN Coordination. Each government has its own rules for using the spectrum. US military use of the spectrum has varying priority from nation to nation. Submitters must

consider US forces that are garrisoned in other nations and must use equipment on a day-to-day basis for training. Equipment that has not obtained HN approval is not authorized for use. This loss of capability can have serious mission impact. The HN coordination process is described in more detail in Attachment 4. Foreign Forces operating within the US&P will follow the guidance as outlined in ACP 190 US SUPP-1(D), **Chapter 3**, para 306f, *Support for HNs Deploying SD Equipment into the US&P*.

4.5. SPS Review. All major systems (excluding EW) used in the US receive MC4EB review and NTIA certification. AFSMO determines which DD Form 1494 or EL CID files require SPS review. With the exception of the systems listed below, goal systems must go through SPS review. **NOTE:** As of November 1, 2009 all spectrum certification applications submitted to the SPS by AFSMO are required to be in EL CID format.

4.5.1. New systems or subsystems and major modifications to existing systems, including all systems operating in the space services or radio determination (radiolocation, radionavigation) services.

4.5.2. All new systems or subsystems and major modifications to existing systems previously reviewed by the SPS if there is a significant impact on the EMS when considering geographical location and frequency availability.

4.5.3. Land mobile radio (LMR) trunked systems.

4.5.4. Other systems or facilities that the NTIA, IRAC, or other government agencies refer to the SPS.

4.5.5. Systems referred for SPS submission by the MC4EB FP Equipment Spectrum Guidance (ESG) Permanent Working Group (PWG).

4.6. Spectrum Supportability Risk Assessment. Certification of spectrum support shall be obtained as required prior to authorization to operate. An integral part of this process is the Spectrum Supportability Risk Assessment (SSRA). SSRA suggested tasks are listed in DoDI 4650.01, Enclosure 3, Table 2, with the detailed process provided in Attachment 5.

5. Frequency Actions.

5.1. Frequency Assignment Guidance. All RF emitters must have a frequency assignment prior to operation. Before making a permanent assignment, the MC4EB must review the RF equipment via a DD Form 1494J unless specifically exempted as noted in Attachment 3. Before making a temporary assignment or special temporary authorization, a DD Form 1494 and EL CID file must be submitted to AFSMO and a J/F-12 number assigned. Frequency assignment parameters must match the technical characteristics of the equipment as listed in the DD Form 1494 or as recommended in the MC4EB guidance page.

5.2. Types of Frequency Assignments. There are four types of frequency assignments listed in the NTIA Manual. Descriptions of, and requirements for, these assignments can be found in Section 9.6: (1) Regular, (2) Temporary, (3) Trial, (4) Group.

5.2.1. Frequency Applications. An application is used for the following frequency assignment actions (SFAF 010):

5.2.2. New (N): To apply for a new frequency assignment.

5.2.3. Modification (M): Used to apply for the addition, substitution or removal of one or more of the particulars, except for Frequency, Agency Serial Number, or Transmitter State/Country, of an existing frequency assignment. No more than 60 data fields of an assignment can be modified at one time. If more than 60 data fields require modification submit either a NEW or NOTIFICATION action using the record replacement feature described in Section 9.8.2.40 (of the NTIA Manual), or a simultaneous DELETION and NEW or NOTIFICATION action.

5.2.4. Notification: Used to notify the bringing into use of a frequency by stations under the authority of Section 7.5.2, 7.12, 8.3.11, 9.1.3, or 9.6.5, of the NTIA Manual.

5.2.5. Renewal (R): To apply for the extension of a TEMPORARY or TRIAL assignment and to simultaneously update other particulars of the assignment.

5.2.6. Deletion (D): To apply for the cancellation of a frequency assignment and the removal of all its particulars from the Government Master File (GMF) and FRRS database.

5.3. Lead-times. Lead-times provide federal agencies and overseas commands and host countries with the time necessary to coordinate and process applications for frequency actions. If the following lead-times are not met, the frequency request must include a mission impact statement if the assignment is not granted by the date requested. Limit such requests to safety of life or urgent matters of national security. In all cases, requesting commands must provide justification/operational impacts statements when the requirement does not meet the required lead-time.

5.3.1. AFSMO lead-times for operations in the US&P. The lead-times below start when AFSMO receives the request and does not include time required by the MAJCOM or intermediate agencies.

5.3.2. Regular Assignments. Sixty (60) business days. In most cases, additional lead-time is required for actions requiring coordination with the FCC or the FAA. Requirements that are not IAW the national table of allocations, or have unusual technical parameters, may require additional engineering time or study. It is not uncommon for such requests to take more than six months at the national level.

5.3.3. Temporary and Group Assignments. Sixty (60) business days. These assignments are described as those temporary assignments requiring more than 90 calendar days but less than five years for entry into the GMF. Additional lead-time is needed for all actions requiring coordination with the FCC or FAA. Requirements not IAW the national table of allocations, or have unusual technical parameters may require additional engineering time or study, consequently requiring even longer lead-times

5.4. Exercise Support. AFSMO will review and provide national level coordination for spectrum support prior to start of the exercise. AFSMO requires frequency assignment actions, operational data, and other documentation in order to accomplish national level coordination. Spectrum Managers need to engage in the earliest stages of the exercise planning process, see Attachment 10.

5.4.1. Exercises which include foreign participants require 150 calendar days for review and coordination. Foreign platforms will require additional documentation to support national level coordination as noted in Annex H, ACP 190 US SUPP-1 (D).

5.4.2. Exercises with only US exercise participants require 120 calendar days for review and coordination.

5.4.3. For operations outside the US&P. Unified commands set lead-times for frequency actions based on agreements with host governments. Generally, theater CCMD JFMOs require a minimum of ninety (90) business days lead-time to process overseas requirements. The 90-day time starts when the CCMD JFMO receives the request. Refer to theater instructions for specific lead-times.

5.5. Frequency Coordination. The DoD does not own spectrum exclusively for military use. In fact, spectrum is not owned by any organization, it is “allotted” and assigned. The DoD, through the Military Assignment Group (MAG), manages the spectrum between 225 MHz through 328.6 and 335.4 MHz through 399.9 MHz for the federal government (NTIA). When it is necessary for the AF to use frequencies managed by another federal department or agency, the AF must coordinate with the appropriate agency prior to submitting a frequency request to the NTIA for assignment action. Coordinate frequency actions as outlined in paras 5.5.1 through 5.5.9 and include a statement of completed coordination and comments with the frequency action.

5.5.1. FCC. Refer to the NTIA Manual for the civil frequency bands requiring coordination. AFSMO completes final coordination with the FCC national office before submitting the request to the FAS for assignment action.

5.5.2. FAA. The FAA manages certain frequency bands through the Aeronautical Assignment Group (AAG), a working group of the FAS. Coordination with HQ FAA is required for all new and existing assignment modifications with changes in technical parameters. AFSMO, a member of the AAG, completes final coordination with the AAG before submitting the request to the FAS for assignment action.

5.5.2.1. FAA coordination procedures are detailed in Attachment 8. Utilize the FAA Web Frequency Coordination Request (WebFCR) site to process assignment proposals for FAA managed frequency bands. Place FAA coordination number and notes in SFAF item 520.

5.5.2.2. If after three attempts to coordinate and two inquiries with the FAA via WebFCR, add the following in SFAF item 520: “Attempted coordination and inquiries with HQ FAA on (list dates) have failed.” Process this SFAF through AFSMO.

5.5.3. DoD AFC. Coordinate frequency actions at, among, and within radio LOS of ranges according to NTIA Manual, para 8.3.26, Table 8.3.26 and Annex D.

5.5.4. Aerospace and Flight Test Radio Coordinating Council (AFTRCC). Coordinate all frequency requirements that fall within the 1435-1525 and 2360-2395 MHz band with the appropriate AFC prior to submission. The AFC coordinates with the AFTRCC coordinator.

5.5.5. Army. Coordinate all AF frequency requirements on an Army installation with the appropriate Army frequency coordinator prior to submission.

5.5.6. Navy. Coordinate all AF frequency requirements on a Navy installation with the appropriate Navy frequency coordinator prior to submission.

5.5.7. Canadian border. Coordination prior to assigning frequencies is required with Canada within 80 kilometers (km) (approximately) of the US/Canadian border for terrestrial communications requirements and 250 nautical miles (nmi) for aeronautical communications requirements. The NTIA coordinates the frequency proposal requirements with Canada. Refer to the NTIA Manual for specific guidance.

5.5.8. Mexican border. Coordination prior to assigning frequencies is required with Mexico within 75 km (approximately) of the US/Mexican border for terrestrial communications requirements and 250 nmi (approximately) for aeronautical communications requirements. The NTIA coordinates the necessary requirements with Mexico. Refer to the NTIA Manual for specific guidance.

5.5.9. Outside US&P. MAJCOMs coordinate frequency actions according to theater policies and procedures through the appropriate AF component command.

5.6. Frequency Application and Approval Channels.

5.6.1. AF Organizations in the US&P.

5.6.1.1. Installation Spectrum Manager. The ISM is responsible to the installation commander for managing all frequency use on the installation and outlying sites/areas under the control of the installation commander. Therefore, all units/organizations assigned to the installation submit their frequency applications/requirements to the ISM. The ISM will:

5.6.1.1.1. Submit proposals for host installation units to the host MAJCOM. (T-2)

5.6.1.1.2. Submit proposals for tenant units supporting the host installation mission to the host's and tenant's MAJCOMs respectively.

5.6.1.1.3. Submit proposals for tenant units not supporting the host installation mission to the supported unit's MAJCOM with a copy to the host and tenant unit MAJCOMs, e.g., as described below:

5.6.1.1.3.1. Submit frequency requirements for a HQ ACC maintenance expediter net on a Headquarters Air Mobility Command (HQ AMC) installation to HQ ACC with a copy to HQ AMC.

5.6.1.1.3.2. Submit frequency requirements for a HQ AFMC unit in support of HQ ACC on a HQ AMC installation to HQ ACC with a copy to HQ AFMC and HQ AMC.

5.6.1.2. ANG and Headquarters Air Force Reserve Command (HQ AFRC) units will:

5.6.1.2.1. Submit actions to support day-to-day operations, training requirements, fixed Air Traffic Control (ATC), and navigational aids (NAVAIDs) at operating bases and permanent training sites, through appropriate channels to the ANG Readiness Center (ANGRC) or HQ AFRC, respectively. The ANGRC or HQ

AFRC sends the actions to AFSMO.

5.6.1.2.2. Submit requests in support of exercise or readiness inspections through the tasking agency to AFSMO.

5.6.1.2.3. The ANG units will submit actions to support state-levied mission requirements through their State Level Joint Force Headquarters (JFHQ-J6 Spectrum Manager's Office) for action, then route to National Guard Bureau (NGB) (HQ ANG-A6 Operations) for necessary adjudication. The Adjutant General (TAG) endorses JFHQ-J6 Spectrum Manager Directives and routes them to FCC Safety and Special Radio Services Bureau.

5.6.1.3. Military Affiliate Radio System (MARS) activities:

5.6.1.3.1. Submit actions for MARS very high frequency (VHF) nets on a military installation or on outlying locations hosted by an installation through the host ISM to the host MAJCOM. MAJCOMs coordinate with the 38th Cyberspace Readiness Squadron (38 CYRS/SCM), 203 West Losey Street, Room 1200, Scott AFB IL 62225-5222 to ensure the net is authorized before sending the action to AFSPC who in turn will submit to AFSMO.

5.6.1.3.2. Civilian affiliate stations send frequency actions to the state MARS director. The state MARS director sends actions to the region communications manager, who, in turn, sends it to the Chief, USAF MARS (38 CYRS/SCM), 203 W. Losey St. Rm. 1200, Scott AFB, IL 62225-5222. If approved, the Chief, USAF MARS sends the frequency action through AFSPC to AFSMO.

5.6.1.3.3. The Chief, USAF MARS and AFSPC coordinate High Frequency (HF) actions. HF assignments are made on a regional basis. The authority for station operation is found in AFI 17-210, *Radio Management*. No formal action is required.

5.6.1.4. Civil Air Patrol (AFAUX/CAP). The CAP is an auxiliary of the AF under 10 USC 9441, et seq., Civil Air Patrol. AFI 10-2701, *Organization and Function of the Civil Air Patrol*, outlines AF support to the AFAUX/CAP. Per SECDEF Organizational Change Request, 10 May 2016, ACC assumed responsibility for CAP. CAP units will submit frequency actions that support AF operations and training, whether in whole or in part, to AFAUX/CAP National Headquarters (AFAUX/CAP-DOSF), 105 South Hansell Street, Maxwell AFB AL 36112-6332. AFAUX/CAP National Headquarters sends the frequency actions to HQ ACC/A6CF, who in turn, sends them to AFSMO.

5.6.1.4.1. AFSMO may assign AFAUX/CAP frequencies for AF units to communicate with the AFAUX/CAP during operational missions.

5.6.1.4.2. AF units may allow AFAUX/CAP to use their assigned frequencies to communicate with other AF units during operational missions.

5.6.1.4.3. AFAUX/CAP units give the ISM a list of frequencies used on the installation.

5.6.1.4.4. AFSMO will maximize the use of regional and the US&P frequency assignments to meet AFAUX/CAP spectrum requirements and registration in the

GMF. Exceptions will encompass requirements, which require GMF registration as defined or required by the NTIA for management of spectrum use in the US, most notably, stations within border zone areas (Canada and Mexico), on federal real estate, at civil airports and stations in proximity to high-density metropolitan or military area facilities. Other location specific stations operating under the auspices of regional or US&P assignments will be registered in FRRS.

5.6.2. AF Organizations Outside the US&P. Overseas units submit frequency requests according to unified command policy. The geographical CCMD is responsible for military use of frequencies within the command's geographical area.

5.7. Contractor Use of Frequencies.

5.7.1. AF Contracts. Contractors must submit frequency requests in direct support of AF contracts through the AF representative (normally the ISM if on an AF base or if at an Acquisition Center, the PO responsible for the contract), to the MAJCOM responsible for administering the contract. Include in the SFAF Item 520, Supplemental Details, associated contract number (s), AF POC, and expiration date of the contract. Note, the contractor must obtain frequency assignments from the FCC for requirements not in direct support of the contract. These licenses/assignments should be entered into FRRS.

5.7.2. Multiple Service Contracts. Contractors must submit frequency requests in support of a multiple service contract through the appropriate spectrum management channels to the military department that is the executive service for the contract. The contractor must obtain frequency assignments from the FCC for requirements not in direct support of the contract.

5.7.3. Foreign Military Sales (FMS), Direct Commercial Sales (DCS), and Hybrid programs. If the intention is to radiate within the US&P, requirements must go through the US&P process (i.e., certification and assignment). However, Hybrid programs will be handled case-by-case.

5.8. Shared-Use Facilities. Shared-use facilities as defined by the NTIA is a radio system using one or more frequencies authorized by the NTIA and one or more frequencies licensed by the FCC. Shared systems may be authorized IAW conditions described in Section 8.2.47, Shared Federal/Non-Federal Radio Systems, of the NTIA manual.

5.9. Joint Bases. With the implementation of Joint Bases throughout DoD, the following is provided for those AF units designated as the lead service to provide spectrum management support for a Joint Base. Table 1 lists all of the locations currently affected by the Joint Basing program and the identified lead service designated to provide overall spectrum management support for those locations:

Table 1. Joint Base Locations.

| Joint Base Installations | Lead Service |
|--|--------------|
| Joint Base Pearl Harbor-Hickam, HI | Navy |
| Joint Region Marianas, Guam | Navy |
| Joint Base Anacostia-Bolling, DC | Navy |
| Joint Expeditionary Base Little Creek-Fort Story, VA | Navy |
| Joint Base Lewis-McChord, WA | Army |
| Joint Base Myer-Henderson Hall, VA | Army |
| Joint Base Charleston, SC | Air Force |
| Joint Base Andrews-Naval Air Facility Washington, MD | Air Force |
| Joint Base Elmendorf-Richardson, AK | Air Force |
| Joint Base San Antonio, TX | Air Force |
| Joint Base McGuire-Dix-Lakehurst, NJ | Air Force |
| Joint Base Langley-Eustis, VA | Air Force |

5.9.1. The Lead Service will designate a spectrum management office (SMO) to provide SM support of the Joint Base EME. The Military Services will ensure that the Joint Base SMO is cognizant of their SD equipment/systems within the boundaries of the Joint Base and the operators of any SD devices obtain and maintain frequency assignments for those systems.

5.9.1.1. The Joint Base SMO will process Joint Service temporary and permanent frequency actions through established channels.

5.9.1.2. In Joint Base environments, the Services are responsible to:

5.9.1.2.1. Pre-coordinate all temporary and permanent frequency proposals with the Joint Base SMO prior to submission to the national level for processing.

5.9.1.2.2. Conduct periodic reviews of their frequency assignments and pre-coordinate updated information with the Joint Base SMO prior to submission to the national level for further processing.

5.9.1.2.3. Obtain an approved equipment certification prior to submitting any frequency proposal. Equipment certification is obtained using the EL CID, via the NTIA SPS process.

5.10. Frequency Assignment Review Program. Each responsible Air Force entity; i.e. MAJCOM, NAF, Center, Wing, etc., and user shall maintain a program of continuing review of assigned radio frequency assignments for its radio stations and shall delete or amend such assignments as appropriate. The objectives of this program are a) to ensure that frequency assignments are in current use and are correctly reflected in the DoD FRRS and the GMF, b) to ensure that frequency assignments are required for continued operations for the purpose stated in their justification, and c) to ensure that frequency assignments are still qualified for authorization under the provisions of the regulations contained in the NTIA Manual and subsequent DoD and AF policy. Each assignment shall be reviewed in a manner specified in Attachment 7 and IAW the NTIA Manual, Annex F. (T-0)

5.11. Non-licensed Devices. A non-licensed device is a low power intentional, unintentional, or incidental radiator or device that conforms to the technical criteria found in the FCC rules, 47 U.S.C., Part 15 or Annex K, NTIA Manual. There are provisions in Sections 7.8 and 7.9

and Annex K of the NTIA Manual that allow federal agencies to operate systems that conform to the FCC's rules in 47 CFR Part 15 (which are incorporated into Annex K of the NTIA Manual) on a non-licensed, non-interference basis. Non-licensed devices are afforded no protection from interference; if interference is caused to an authorized service the non-licensed device must cease operation. Because of this, AF activities must exercise caution in procuring and using non-licensed devices. Examples of non-licensed devices are wireless local area networks, wireless microphones, and cordless telephones. Using activities are strongly advised not to use non-licensed devices for critical command and control applications essential for mission success, protection of human life, or high value assets. Frequency registration will be coordinated at the local spectrum management level and documented in the FRRS when the device directly supports an AF mission.

5.12. Frequencies Not Requiring Specific Assignment. International distress and emergency frequencies do not need specific assignments for use. Table 6.2 lists frequencies not requiring assignment for use in the US&P. Outside the US&P, theater commanders and HNs determine frequencies that do not need specific assignment.

5.13. Emergency Frequency-Sharing Notification. Under emergency conditions, several government agencies (i.e., Federal Emergency Management Agency operations) may operate on, or near, frequencies assigned to AF organizations. When this occurs, one of the involved agencies should coordinate with the affected AF organization to arrange frequency sharing during the emergency. AF units will cooperate fully during emergencies unless frequency sharing would jeopardize mission-essential operations. To properly coordinate at the national level, a representative for the local AF units must up-channel the information concerning the emergency situation. Ideally, this information should flow through command channels to notify AFSMO.

5.14. Air Force Spectrum Interference Resolution (AFSIR) Program. EMI is any EM disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment. It can be induced intentionally, as in some forms of EW, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and the like. The AFSIR program, discussed in AFI 17-221, contains guidance for units experiencing EMI that must be resolved on a case-by-case basis. The 85th Engineering Installation Squadron (85EIS), Keesler AFB, MS can provide technical assistance to AF units to resolve interference. Units that experience interference and require on-site assistance may request Quick Fix Interference Reduction Capability assistance IAW AFI 17-221.

6. Guidance for Specific Cases of Frequency Usage.

6.1. General. This chapter lists permissible frequency usage within the US&P. Unless otherwise noted, frequency assignments are necessary for the specific frequencies.

6.2. Non-Licensed/Annex K Devices. The Purchase and Use of Federal and FCC Non-Licensed Devices is outlined in Section 7.8 of the NTIA Manual. The following AF caveats and warnings apply:

6.2.1. AF activities should not use non-licensed equipment for critical tactical or strategic command and control applications essential for mission success, protection of human life, or protection of high-value assets, as they offer no protection of spectrum use

in support of operational requirements. Non-licensed devices operate on a non-interference basis, which includes accepting any interference from any federal or non-federal authorized radio station, other non-licensed device, or industrial, scientific, and medical equipment.

6.2.1.1. Upon notification by cognizant spectrum management personnel that the device is causing interference, the operator of the non-licensed device shall cease all radiation from the device until it can be proven that further use will no longer cause interference.

6.2.1.2. Users will not modify, modernize, enhance, or change the equipment's power, antenna, waveform, or information transfer characteristics in any manner that would cause it to violate the NTIA criteria for non-licensed devices or the device's FCC type certification.

6.2.2. US&P Operations. Unmodified non-licensed devices (i.e., devices meeting the standards in 47 CFR Part 15 as incorporated into Annex K of the NTIA Manual) operating within the US&P do not require NTIA certification or an approved NTIA frequency assignment. However, the AF requires a frequency assignment registered in the FRRS and a DD Form 1494 coordinated with the ESG PWG for information purposes only.

6.2.3. Outside US&P Operations. Theater commanders and HNs decide if frequency support is available and the requirements for frequency assignments. Users must submit a DD Form 1494 through the supporting spectrum manager for equipment that radiates and will be deployed outside the US&P. After obtaining HN approval, users may request frequency assignments. US non-licensed devices require HN approval to operate.

6.2.4. Use of Ionospheric Sounders. Reference Section 8.2.21 of the NTIA Manual. In addition to the minimum information required in the sounder frequency assignment request, the SFAF will include the following: pulses per channel, sweep rates, sweep intervals, pulse width (duration), pulse repetition rate (PRR), antenna type, antenna orientation, and the statement, "No existing authorized ionospheric sounder system is capable of meeting this requirement." Also, include on line SFAF 500, special note - S383.

6.2.5. Chirpcomm. Chirpcomm is a low power, highly reliable message transmission capability system used in conjunction with sounders. The system sends nonsecure narrative messages up to 38 characters, with a two character transmit station identifier. This subsystem supplements and sustains existing HF communications circuits by enhancing the sounder capability. However, EMC differs significantly from the sounder-only mode. You must consider potential interference to other HF circuits and meet the following conditions:

6.2.5.1. US military Chirpcomm systems are authorized only for critical or contingency requirements when standard methods of communication are not feasible.

6.2.5.2. Obtain specific frequency assignments for the Chirpcomm mode in addition to those for the chirpsounder.

6.2.5.3. AFSMO coordinates Chirpcomm systems within the US&P with the NTIA.

6.3. AF Considerations for use of HF systems in the CONUS. To insure sufficient frequencies will be available for the operation of radio circuits essential to the national security and defense and to conserve frequencies below 30 MHz for services which cannot be operated adequately without them, AF activities will adhere to the regulations contained in Section 8.2.11 of the NTIA Manual.

6.4. VHF Air/Ground (30-50, 118-136, 138-144 MHz). VHF air-to-air and air-to-ground communications supports both ATC and tactical operations.

6.4.1. VHF ATC. VHF ATC operations are conducted in the 118-136 MHz band. The AAG controls the use of these frequencies. The FAA considers normal ATC operations at a location to consist of: one ground control, one local control, two approach controls, one departure control, and one Automatic Terminal Information Service (ATIS), and Automated Surface Observation System (ASOS)/Automated Weather Observation System (AWOS). **NOTE:** If additional frequencies are required, justification must be provided in SFAF Item 520. This justification will be considered by HQ FAA to determine the need for the additional frequencies. All requirements must be coordinated via FAA WebFCR. A service volume must be included on all ATC assignments (SFAF Item 503). FAA coordination information must be listed in the Notes Free- text Comments (SFAF Item 501) as a M018 note. Additionally, in certain RF saturated regions not all normal ATC operations can be supported with a FAA VHF band assignment.

6.4.2. VHF Tactical Operations. VHF tactical operations are normally conducted in the 30-50 or the 138-150 MHz bands.

6.4.3. VHF Pilot to Dispatch. This function cannot reside in the 108-136 MHz frequency band. Place this function into the band of 138-150 MHz. Use 139.3 MHz when feasible, to standardize AF operations.

6.5. Ultra High Frequency (UHF) (225-399.9 MHz). The 225-399.9 MHz band, referred to as the UHF band, supports fixed, mobile, aeronautical radionavigation, and satellite operations. Assignments to support the various functions must be IAW the channeling plan. The following are various AF functions supported in the 225-399.9 MHz band:

6.5.1. Aeronautical Operations. Within the US&P, the MAG recommends assignment action used to support aeronautical operations. Frequencies are channeled in 25 kHz increments and must be used IAW the USMC4EB-M-002-12, 225-399.9 MHz allotment plan. The use includes both air-to-air and air-to-ground operations. Typical uses include ATC, squadron operations, etc. When processing assignment requests for aeronautical operations, a service range and height must be included.

6.5.1.1. Air-to-Air Refueling. All frequencies used for air-to-air refueling must contain the track number, exit and entry points on the track, and the names of the sites with the track geographical coordinates.

6.5.1.2. ATC Frequencies. ATC frequencies are used solely to control the movement of aircraft. ATC services include approach control, departure control, clearance delivery, enroute control, ground control, and local control. The AAG controls all frequencies used for ATC and must coordinate prior to an assignment being made. ATC communications support is provided by military and civilian FAA certified

facilities in direct support of the National Airspace System (NAS) and conducted under a MOU between the facility and FAA. Coordination is required via FAA WebFCR for all ATC requirements.

6.5.1.2.1. Communications between military stations and aircraft operating within a military operating area, after being handed over by FAA control, are not considered ATC operations.

6.5.2. Wideband Operations. Any bandwidth greater than 12.5 kHz is considered a wideband requirement. Frequencies used must conform to the designated wideband allotments in the UHF allotment plan.

6.5.2.1. Fixed Multichannel Radio Relay. Fixed multichannel radio relay is not permitted to operate in this band within the US&P, except for tactical exercises or training, or unless demonstrated that its use is the only effective way to satisfy a communications requirement. Multichannel radio relay is normally a duplex operation; therefore, make sure frequencies are requested for both locations.

6.5.3. Satellite communications. The 225-399.9 MHz band is used to support military satellite communications. Per USMC4EB-M-002-12, *Allotment Plan for the 225-399.90000 MHz Frequency Band*, Annex D provides the plan for satellite communications.

6.6. NAVAID Frequencies. NAVAIDs help provide safe and efficient operation of civil and military aircraft. All frequency assignments for NAVAIDs are under the control of the AAG and require HQ FAA coordination except the long-range aid to navigation (LORAN) system. There are many radio frequencies used to support airfield operations at a typical AF installation. Periodically, the ISM should compare assigned frequencies against the DoD flight information publications (FLIP). Errors should be brought to the attention of the airfield manager so the FLIP can be corrected, or frequencies changed to those assigned. Aeronautical NAVAIDs and their allocated frequency bands are:

6.6.1. Low Frequency (LF) and Medium Frequency (MF) Non-Directional Beacons (NDB). Frequencies for LF or MF radio beacon operations range from 70 to 2000 kHz. AF NDBs normally operate in the 200-415 and 510-535 kHz band within the US&P. A Station Class of ALB, emission of 2K04A2A, and service volume (SFAF Item 503) are required for each proposal.

6.6.2. Instrument Landing System (ILS). The ILS consists of three components: marker beacon, localizer, and glideslope. The ILS provides guidance for an aircraft on final approach to a runway. The runway number that the ILS will service must be documented in the frequency assignment.

6.6.2.1. Marker Beacon. The marker beacon operates on a standard frequency of 75 MHz. The marker beacon indicates a specific location along the final instrument approach. Station Class: ALA; Emission 6K00A2A.

6.6.2.2. Localizer. The localizer operates in the 108.1-111.95 MHz band and transmits horizontal guidance signals to direct the aircraft to the runway centerline. The localizer also transmits a Morse code airfield identifier consisting of the letter "I" followed by a Runway number (SFAF Item 503) and NAVAIDS Identifier (SFAF

Item 304) that must be included in the proposal. Station Class: ALL; Emission 2K04A1A (without voice).

6.6.2.3. ILS Glideslope. The frequency band 328.6-335.4 MHz transmits vertical guidance signals for descent to the runway. The Glideslope is allocated for aeronautical radionavigation and is used to support ILS Glideslope. Glideslope and localizer frequencies are paired according to the channeling plan shown in the NTIA Manual. The AAG controls these assignments. Coordination is required with the FAA via WebFCR for all ATC requirements.

6.6.3. Microwave Landing System (MLS). The MLS operates in the 5031-5090.7 MHz band and is the International Civil Aviation Organization (ICAO) approved replacement for the current ILS system. The MLS is based on time-referenced scanning beam, referenced to the runway, allowing aircraft to determine precise azimuth angle and elevation angle. The FAA engineers support the MLS and associated precision Distance Measuring Equipment (DME) operating in the band 972-1143 MHz.

6.6.3.1. Mobile Microwave Landing System (MMLS). The AN/TRN-45 is a tactical military precision approach and landing system that is compatible and interoperable with the national and international MLS systems. It is designed as a tactical landing guidance for military aircraft and provides azimuth, elevation data, and range information at off-base landing sites. The AN/TRN-45 has two transmitters. The first transmitter is in the 979-1143 MHz frequency range and is used for DME. A second transmitter is in the 5031-5090.7 MHz frequency range and is used to transmit data, azimuth, and elevation as specified by the ICAO. Coordination is required with the FAA via WebFCR as they engineer the frequency support for MMLS systems. This system is highly transportable as it is deployed to off-base landing sites.

6.6.4. Tactical Air Navigation (TACAN). The TACAN provides short-distance range and azimuth information to the aircraft. The TACAN system consists of an airborne interrogator operating in the 1025-1150 MHz band and a ground transponder operating in the 962-1024 MHz or 1151-1213 MHz band. In some cases the transponder is on an airborne platform. This configuration is referred to as air-to-air TACAN. This configuration is used, for example, during air refueling. The band 962-1024 MHz is referred to as low band and 1151-1213 MHz is referred to as high band. This is important when supporting tactical equipment because many systems have a low band antenna and a high band antenna; therefore, know which is in use in order to request frequency supportability. When making assignments normally only the ground transmit frequency (SFAF Item 110) is assigned and its paired airborne frequency is assumed. TACANs are classified into three categories depending on their operational use: terminal facility, local enroute facility, or high enroute facility. The classification of the facility is important because it determines the level of protection afforded the facility. The standard service volume (SSV) (SFAF Item 503) is required on all assignments.

6.6.4.1. SSV. Ground stations are classified according to their intended use. These stations are available for use within their service volume. Outside the service volume, reliable service may not be available. For standard use, the airspace boundaries are called SSVs. They are defined in Table 2 for the three station classes.

Table 2. Standard Service Volume

| SSV Class Designator | Altitude and Range Boundaries |
|-----------------------------|--|
| T (Terminal) | From 1000 feet (305 m) above ground level (AGL) up to and including 12,000 feet (3,658 m) AGL at radial distances out to 25 nmi (46 km). |
| L (Low Altitude) | From 1000 feet (305 m) AGL up to and including 18,000 feet (5,486 m) AGL at radial distances out to 40 nmi (74 km). |
| H (High Altitude) | From 1000 feet (305 m) AGL up to and including 14,500 feet (4,420 m) AGL at radial distances out to 40 nmi (74 km). |
| SSV Class Designator | Altitude and Range Boundaries |
| | From 14,500 feet (4,420 m) AGL up to and including 60,000 feet (18,299 m) at radial distances out to 100 nmi (185 km). |
| | From 18,000 feet (5,486) AGL up to and including 45,000 feet (13,716 m) at radial distances out to 130 nmi (241 km). |

6.6.4.2. TACAN Channels. Airborne and ground TACAN frequencies are paired to form 126 "X" channels and 126 "Y" channels as shown in the NTIA Manual. In the "X" configuration, the ground reply frequency is 63 MHz less than the airborne frequency for channels 1-63 (low band) and 63 MHz higher for channels 64-126 (high band). In the "Y" configuration, the ground reply frequency is 63 MHz higher than the airborne frequency for channels 1-63 and 63 MHz lower than the airborne frequency for channels 64-126. The AF primarily uses "X" channels within the US&P, except for certain air-to-air TACAN operations. TACAN channels 1-16 and 60-69 are reserved for military tactical and training operations, while the remaining 100 "X" channels are used by the NAS.

6.6.4.3. Air-to-Air TACAN Channels. The following applies to AF units that need to use TACAN channels for air-to-air operations:

6.6.4.3.1. TACAN frequency assignments are normally for a 10-year period, with renewal, after coordination with the FAA.

6.6.4.3.2. TACAN operations using the azimuth mode are authorized only within areas bounded by specific geographical coordinates. Send frequency proposals in SFAF to AFSMO through the appropriate MAJCOM. Include in SFAF Item 531 the geographical coordinates that enclose the desired area of operation. If several states are involved, insert "USA" in Items 300 and 400 and list all states in SFAF Item 530. Coordinate with FAA for all areas involved. Ask for "Y" channels if technically possible. State the number of channels needed and justify their use in SFAF Item 520.

6.6.5. Distance Measuring Equipment (DME). DME operates on frequencies in the UHF spectrum between 962-1213 MHz in a LOS principle and furnishes distance information with a high degree of accuracy. In the operation of DME, paired pulses at a specific spacing are sent out from the aircraft (this being the interrogation) and are received at the ground station. The ground station (transponder) then transmits paired pulses back to the aircraft at the same pulse spacing but on a different frequency. The time required for the

round trip of this signal exchange is measured in the airborne DME unit and is translated into distance (nmi) from the aircraft to the ground station.

6.6.5.1. Air-to-air DME operations are authorized on an area-wide basis (e.g., state or states, US, or US&P). Submit frequency proposals for DME operations in SFAF through command channels to AFSMO. Give the number of channels needed, the maximum number of aircraft involved in the operation and justification for use of the civil channels. Apply for “Y” channels if technically possible. Include in SFAF Item 520 the statement, “Required for DME operations only; will not use the azimuth mode.”

6.6.6. VOR. VHF Omnidirectional Range facilities provide bearing information to aircraft and operate in the 108-117.95 MHz band as shown in the NTIA Manual. Most VORs use voice and Morse code transmissions to identify the ground facility.

6.6.7. VOR Tactical Air Navigation (VORTAC). The VORTAC is a facility consisting of a collocated VOR and TACAN. The VORTAC is the most common unified aid within the AF. Both facilities are located in the same place, transmit simultaneously on a paired channel and share the same three-letter identifier. If the facilities do not meet the following antenna separation criteria, they are not considered a single NAVAID and must use unpaired channels and different identifiers. Only the FAA may waive these requirements.

6.6.7.1. For stations used in terminal areas for approach procedures, the separation for a standard VOR antenna and the associated DME or TACAN antenna will not exceed 100 feet. For a Doppler VOR antenna and associated DME or TACAN antenna, separation will not exceed 260 feet.

6.6.7.2. VOR and DME or TACAN antenna separation will not exceed 2,000 feet for facilities providing only enroute services. Refer to the NTIA Manual for complete table.

6.6.8. ATC Radar Beacon System (ATCRBS) Identification Friend or Foe (IFF) and Selective Identification Feature (SIF). The IFF/SIF consists of a ground interrogator that operates on 1030 MHz and an airborne transponder that replies to the interrogations on 1090 MHz. Frequency assignments are required for both the ground interrogator and airborne reply. Frequency 1090 MHz is also used to transmit Automatic Dependent Surveillance-Broadcast (ADS-B) data asynchronously as an extended squitter 1090-ES. These emissions also require a frequency assignment. The IFF/SIF is normally paired with the airport surveillance radar (ASR). If the IFF/SIF is paired with an ASR, SFAF Item 503 must cross reference the ASR. For example: P/W AN/TPX-42, PRR250.

6.6.8.1. The transmitter power of beacon interrogators used with terminal surveillance radars is normally 300 watts.

6.6.8.2. IFF/SIF ramp tester units will use a PRR of 230 pulses per second (PPS), triggered for stability and limited to 4 watts of transmitter power to the antenna.

6.6.8.3. PRRs for IFF/SIF may be the same as, or submultiples of the ASR PRR. Also, if the ASR operates with a staggered PRR, the IFF/SIF may also operate with a staggered PRR, normally below 400 PRR.

6.7. Radar. Radar systems operate in various portions of the spectrum.

6.7.1. Aeronautical Radio Navigation Radar. Only ground-based radars performing an ATC function may use these frequency bands. Use includes associated airborne transponders activated by radars operating in the same band. Coordinate with FAA via WebFCR before sending frequency proposals. Radar equipment performing a function other than listed below will not normally have frequency assignments in these bands.

6.7.2. Long-Range Radar (LRR). The 1240-1370 MHz band is used for LRR.

6.7.2.1. Air Surveillance Radar (ASR). ASRs operate in the 2700-2900 MHz band. The FAA controls the frequencies and PRR. In certain areas of the US it is difficult to accommodate new radars in the 2700-2900 MHz band. Radar systems complying with Criteria D of the Radar Spectrum Engineering Criteria (RSEC), under the NTIA Manual, shall incorporate additional EMC features when intended for use in designated heavily used areas, or for collocated operations with other radars. The HQ FAA and the agency asking for the assignment assess the need for these additional EMC features when coordinating a frequency assignment in the 2700-2900 MHz band. Frequency assignments for those radars with the additional EMC features installed will contain record note S373.

6.7.2.2. Precision Approach Radar (PAR). PARs operate in the 9000-9200 MHz band.

6.7.3. Aircraft Control and Warning (AC&W). The military AC&W radars operate in the 2900-3100 MHz band. The FAA does not control this frequency band; however, since the AC&W radar is normally paired with an IFF/SIF, the FAA will need to know the PRR of the AC&W radar so they can properly coordinate on the PRR for the IFF/SIF.

6.8. Radar Speed Guns. Police radar speed guns, are not exempt from requiring spectrum equipment allocation and frequency assignment.

6.9. Commercial Satellite Use. See para 6.43., Commercial Satellite Communications, for additional information and guidance on DoD use of commercial satellites.

6.10. Spacecraft and Balloon Systems. Spacecraft and balloon systems developed or operated by the AF must be capable of on and off control of emissions by telecommand.

6.11. Electronic Fuses. Installation commanders set local coordination procedures for installation and tenant activities that develop, design, or use electronic fuses. Electronic fuses that activate detonation devices do not require NTIA spectrum certification. Units that develop, design, or use electronic fuses must:

6.11.1. Research, determine, and evaluate existing frequency assignments for compatibility with the intended RF environment.

6.11.2. Contact the applicable spectrum managers (MAJCOM or DoD AFC) to select fuse frequencies.

6.11.3. Limit fuse-triggering transmitter emissions to the narrowest bandwidth possible.

6.11.4. Reduce the level of unnecessary emissions.

6.11.5. Use equipment tunable on more than one frequency.

6.11.6. Provide protection from accidental triggering by other RF emissions through coding, improving receiver selectivity, shielding components, or other techniques.

6.12. Weather Radars. Weather radars normally operate in the 2700-2900 and 5350-5650 MHz bands. Spot frequency assignments are required.

6.13. Weather radars that use conventional magnetron output tubes have inherent spurious emission levels that may cause RF interference to digital radio-relay microwave systems. Existing radars in the category include the WSR-57, WSR-74S, WSR-74C, AN/FPQ-21, and the AN/FPS-77. Users must install RF waveguide filters that reduce the spurious emission levels by at least 40 dB before using these radars at a new location.

6.14. Telemetry Frequencies. The following bands are allocated for telemetry operations of aeronautical vehicles, upper atmosphere research devices, guided missiles, space system boosters, and space vehicles subject to compliance with NTIA Manual 4.3.4, *Telemetry Plan*.

6.14.1. The 1435-1535 MHz and 2360-2395 MHz bands. These frequencies are designated for telemetry and associated telecommand during flight testing of manned and unmanned aircraft, missiles, or their major components. Coordinate all operations in these bands with the AFTRCC and the applicable AFC. The NTIA Manual provides detailed AFTRCC procedures. Refer to Section 8.3.17, NTIA Manual for the AFTRCC coordination agencies.

6.14.1.1. Assignments in both bands are centered on frequencies at standard intervals of 1 MHz, beginning at 1435.5 and 2310.5 MHz respectively, and are allowed bandwidths of 1, 3, or 5 MHz. Assignments with bandwidths greater than 1 MHz are centered so they do not extend outside the allocated bands. Emissions with bandwidths greater than 5 MHz may be approved by NTIA on a case-by-case basis.

6.14.1.2. The 1435-1525 MHz band consists of ninety-nine (99) 1-MHz channels designated for telemetry.

6.14.1.2.1. Frequencies 1444.5, 1453.5, 1501.5, 1515.5, 1524.5, and 1525.5 MHz are shared with flight telemetry mobile stations. Use limited to 1 MHz bandwidth except for frequencies 1524.5 and 1525.5 MHz where a bandwidth of 2 MHz is permitted.

6.14.1.3. The 2310-2390 MHz band consists of seventy-three (73) 1-MHz channels designated for telemetry.

6.14.1.3.1. Frequencies 2312.5, 2332.5, 2352.5, 2364.5, 2370.5, and 2382.5 are shared on a coequal basis with operations of expendable and reusable launch vehicles. Such use is limited to 1 MHz bandwidth.

6.14.1.4. Telemetry associated with launching and reentry into the earth's atmosphere, as well as incidental orbiting before reentry of occupied objects undergoing flight tests, is also allowed within these bands.

6.14.1.5. Telecommand stations authorized to operate in these bands must directly support telemetry functions. Assignments are limited to 1 MHz bandwidth and must use antennas having a half-power beamwidth of no more than 8 degrees and a front-to-back ratio of at least 20 dB.

6.14.1.6. Channels designated for aeronautical telemetry in the 1435-1525 MHz band are also available for space telemetry on a shared basis.

6.14.1.7. The 1530-1535 MHz band is allocated primarily to Maritime Mobile (MM) satellite services (MSS); mobile aeronautical telemetry is secondary.

6.14.2. The 2025-2100 MHz and 2200-2290 MHz bands. These frequencies are designated for telemetry and associated telecommand for launch vehicles, missiles, and upper atmosphere research rockets, in addition to space missions (of extended duration). Such use is on a coequal shared basis with fixed and mobile LOS operations. All (space-related) operations in these bands must be coordinated with DoD and National Aeronautics and Space Administration (NASA).

6.14.2.1. The 2200-2290 MHz band consists of ninety (90) 1-MHz narrowband channels beginning at 2200.5 MHz in 1-MHz increments through 2289.5 MHz.

6.14.2.2. Emission bandwidths greater than 1 MHz are permitted, provided the assigned frequencies are centered on the center frequencies of narrowband channels and do not extend outside the allocated band.

6.14.2.3. No provision is made in the 2200-2290 MHz band for flight testing of piloted aircraft.

6.15. International Distress and Emergency Frequencies. The U.S. Government and DoD have adopted the international distress and emergency frequencies shown in Table 3. Frequency assignments are not required.

Table 3. Emergency Frequencies.

| SERVICE | FREQUENCY (EMISSION) | COMMUNICATION SERVICE | FUNCTION |
|--|-------------------------|---|---|
| International Distress and Emergency | 500 kHz | Aeronautical, Maritime, Survival Craft | Distress (Telegraphy) |
| | 2182 kHz | Aeronautical, MM, Survival Craft | Distress |
| | 3023 kHz | Mobile | Search and Rescue (SAR) |
| | 5680 kHz | Mobile | SAR Operations |
| | 8364 kHz | Aeronautical, MM | SAR |
| | 40.5 MHz | Mobile | Military Joint Common (US&P only) |
| | 121.5 MHz | Aeronautical | Emergency and Safety |
| | 123.1 MHz | Aeronautical, Mobile | SAR, Scene of Action |
| | 156.3 | Aeronautical, MM | SAR Operations |
| | 156.8 MHz | MM | Call, Reply and Safety |
| | 243.0 MHz | Military Aeronautical | Emergency and Survival |
| | 406-406.1 MHz | Mobile-Satellite | Emergency Position- Indicating Radiobeacon |
| | 53.3 MHz (36K00F3E) | | |

6.15.1. Any mobile station experiencing an emergency may use the frequencies listed in Table 6.2. If a mobile station in distress is unable to make contact on emergency frequencies, it may use any available means to obtain help. Policies for using these frequencies are:

6.15.1.1. Send distress calls or messages only on the authority of the person responsible for the ship, aircraft, or other vehicle carrying the mobile station.

6.15.1.2. The frequencies are used only for actual emergencies, not for simulated emergency training.

6.15.1.3. Do not radiate when testing an emergency frequency during experimental, production, or maintenance operations.

6.15.1.4. Do not make operational checks to ensure proper system operation (confidence checks) more than once in any 24 hour period and keep them as short as possible.

6.15.1.5. Activities completing a communications contact on equipment used for emergency purposes will consider the contact the confidence check for that period.

6.15.1.6. Only make confidence checks with stations authorized to operate on the particular emergency frequency. Do not transmit "in the blind" for confidence checks.

6.16. Radio Amateur Civil Emergency Services (RACES). AF activities may make initial contact on the frequencies listed in Table 6.2 with RACES stations to coordinate on emergency or disaster related matters IAW the FCC rules covered in 47 C.F.R. § 97.407. Additional information can be found in the NTIA Manual.

6.17. Standard Frequency and Time Broadcasts. Frequencies are nationally and internationally allocated and assigned for specific stations to broadcast time and frequency signals. The following are key points about the national standard broadcasts:

6.17.1. US Standard Broadcasts. The National Institute of Standards and Technology of the Department of Commerce operates three radio stations providing highly accurate frequency and time signals:

6.17.1.1. WWV near Fort Collins CO broadcasts on frequencies 2.5, 5, 10, 15, and 20 MHz.

6.17.1.2. WWVB, also near Fort Collins CO broadcasts on frequency 60 kHz.

6.17.1.3. WWVH, on the island of Kauai HI broadcasts on frequencies 2.5, 5, 10, and 15 MHz.

6.17.1.4. These stations provide government and private agencies precise time and accurate frequency signals for setting chronometers and calibrating frequency-sensitive equipment.

6.18. DoD Use of Frequencies in Non-Federal Government Bands. The military may use some frequencies allocated for non-federal government use on a secondary, NIB as outlined below. These frequencies may be used to meet peacetime tactical and training requirements as well as military test range operations. The frequencies are used only when government bands will not satisfy frequency needs and when use does not cause interference to non-

federal government users. The military must accept any interference caused by non-federal government authorized users. Military use of a frequency will not bar new non-federal government assignments on that or adjacent frequencies.

6.18.1. The 4-27 MHz Maritime Mobile (MM) and Broadcasts Bands. AF activities may use frequencies allocated to the MM service and broadcast services for peacetime military tactical and training purposes within the US&P. Refer to the NTIA Manual Section 7.15.2.

6.18.1.1. MAJCOM SMOs are delegated assignment authority in these bands to exclude use of long haul communications. No assignment in either the GMF or the FRRS is required.

6.18.1.2. MAJCOMs will implement procedures to track assignments within their respective command to include unit, location, and inclusive dates (not to exceed 1 year). Either spot frequency or band assignments are authorized.

6.18.1.3. MAJCOMs may not use this authority to circumvent standard frequency assignment procedures for fixed terrestrial systems or HF networks.

6.18.1.4. This authority is to support training and field operations around an installation or exercise area where the type of equipment used is either portable or transportable. Aeronautical mobile operations are strictly prohibited.

6.18.1.5. Users will limit transmitter power to the minimum necessary for reliable communications and will not exceed the power for specific types of emissions. Refer to the NTIA Manual Section 7.15.2 paras 1, a and b for the allowable frequencies, emissions, and power levels in the 4-27 MHz band.

6.18.1.6. When notified by the FCC or other authority that AF transmissions are interfering with a MM or broadcast station, the identified station will immediately cease operation.

6.18.1.7. Users may receive interference on these bands and will not try to obtain relief from such interference; however, they can request a replacement frequency through command spectrum management channels.

6.18.1.8. AFSMO reserves assignment authority for those frequencies listed in Section 7.15.2, para 2 of the NTIA Manual for long haul HF operations. Request use of these frequencies through command channels.

6.18.2. Military use of non-federal government bands above 25 MHz.

6.18.2.1. The AF may use frequencies in the non-federal government bands above 25 MHz for tactical and training operations in the US&P as shown in the NTIA Manual Section 7.15.3. AF activities will coordinate use with their host MAJCOM SMO and the local FCC through the FCC Watch Officer.

6.18.2.2. Military use of these frequencies will not bar present or future assignments of non-federal government frequencies to non-military government agencies through normal IRAC and FCC coordination.

6.18.2.3. The military will protect specific non-federal government frequencies authorized for government agencies.

6.18.3. Military Test Range Operations. The FCC and the military services have arranged for the military use of non-federal government bands at the military test ranges shown in the NTIA Manual Section 7.17. The authorized frequency bands are listed in the NTIA Manual. The following procedures apply to use of these non-federal government bands:

6.18.3.1. Do not use these frequencies if government bands can satisfy the requirement.

6.18.3.2. Limit use to those intermittent operations that can be stopped immediately upon notification that they are causing harmful interference.

6.18.3.3. Select frequencies to avoid harmful interference to known non-federal government operations.

6.18.3.4. Where practical, the military station identifies itself using a call sign or periodic interruption according to a prearranged schedule.

6.18.3.5. Do not use non-federal government bands to develop military systems that may need a new frequency allocation.

6.19. Amateur Frequencies. The military services may not use amateur frequencies within the US&P during normal peacetime conditions, except as authorized by the NTIA or FCC.

6.20. Citizen Band (CB) Radio Service. AF CB stations must operate IAW 47 CFR Part 95, *Personal Radio Services*. AFSMO maintains frequency assignments within this band authorized by the FCC for AF CB operations. Frequency proposals for CB frequency assignments are considered on a case-by-case basis based on justification and operational concept. Assignments will include record note S348 in SFAF Item 500 and results of national level coordination with the FCC.

6.20.1. Law enforcement agencies may communicate with the motoring public on and around an installation for the purpose of providing emergency assistance to the public. Use CB Channel 9 for this purpose.

6.20.2. Emergency vehicles using public highways for travel or guarding military convoys may communicate with the motoring public and civil authorities.

6.20.3. Convoys traveling on public highways may communicate with the motoring public and civil authorities.

6.20.4. Only US government personnel may operate the equipment.

6.20.5. Do not use CB radios to conduct military-related communications, or instead of obtaining a frequency assignment to operate on an appropriate military system.

6.20.6. Users will not submit frequency requests for CB assignments. Authorization for the use of CB will only be granted IAW the above rules.

6.21. Broadcasting Service Frequencies. The military services are not authorized to operate any broadcast facility within the US&P, except in select circumstances. Exceptions are Travelers Information System Amplitude Modulation (AM) broadcast stations that are licensed through the FCC. These stations are non-commercial and are generally restricted to bulletin board-type information such as available installation facilities, travel restrictions, and

driving hazards. Submit requirements for broadcast facilities through command channels to AFSMO for FCC coordination.

6.22. Cellular Telephone Systems. These systems operate on non-federal government frequencies. National regulations do not permit assignment of these frequencies to government agencies (including DoD). AF activities planning to procure transportable Advanced Wireless Service (AWS), Cellular, and Personal Communications Services (PCS) Systems, including Cell-On-Wheels (COW) and Cell-On-Light Truck (Colt) systems, which operate in the bands 698-758, 775-788, 805-806, 824-849 MHz, 901-902 MHz, 930-931 MHz, 940-941 MHz, 1710-1755 MHz, 1850-1990 MHz, and 2110-2155 MHz are required to obtain NTIA spectrum certification.

6.22.1. Consumer Signal Booster (Cell Repeater). Consumer signal boosters are permitted on AF installations. However, ISM approval must be granted prior to any contractual agreements with service providers. In addition, a JSC study must be performed to ensure there will be no RF interference to federal systems. If no harmful interference is predicted in the JSC study, use of a consumer signal booster is permitted at the discretion of the ISM providing the power levels are maintained at/below FCC class B Part 15 requirements and are acquired from wireless providers. The repeater may not be modified from manufacturer's specifications. Use/location of repeaters must be approved by appropriate cybersecurity personnel. Repeaters do not require certification and are provided no protection from interference other than what may be experienced in the non-federal bands. These devices can only be used if and only if the following conditions are met: 1. Subscriber obtains some form of licensee consent to operate the booster. 2. The booster is registered with their provider. 3. Booster meets the Network Protection Standard. 4. Booster is FCC certified. 5. The booster is operated on a secondary, non-interference basis and must be shut down if it causes harmful interference.

6.23. Pager Systems. The 138-144 MHz band is used for AF pager systems, unless another band is required for operational reasons. AF activities will study shared use of existing paging systems in the area before asking for a frequency assignment and obligating funds for equipment. Ensure a pager frequency authorization is available before deploying pager equipment overseas.

6.24. Maritime Mobile (MM) Frequencies. The 156-162 MHz band is allocated primarily for non-federal government MM communications.

6.24.1. The channels in the MM band are reserved for communications between vessels and designated commercial marine operators and for non-federal government ship-to-shore and inter-ship operations.

6.24.2. Government stations may request the use of specific channels on a case-by-case basis if they have a valid need to communicate with the affected non-federal government licensees. AF activities will submit requirements through command channels to AFSMO.

6.24.2.1. When using MM frequencies, regulations in the NTIA Manual must be adhered to. Channel 6, 156.3 MHz, may be authorized for inter-ship communications. This channel is authorized for coordinated operation at the scene of a SAR incident (refer to the NTIA Manual). Coast stations may use this channel during emergencies

affecting life or property when other means of communications are not practical. Channel 22, 157.1 MHz, is the primary frequency for liaison communications between ship stations and the US Coast Guard stations. AF activities will submit requirements through command channels to AFSMO. Channels 81A and 82A are allocated for “US Government Only” and can be requested to support AF operations.

6.25. Experimental Radio Stations. Certain experimental radio stations are authorized by the NTIA Manual to use any RF except those bands specifically excluded by the NTIA Manual for short or intermittent periods without prior authorization of specific frequencies, subject to conditions outlined in Section 7.11 of the NTIA Manual.

6.26. Industrial, Scientific, and Medical Equipment. Industrial, scientific, and medical (ISM) equipment is defined as the operation of equipment or appliances designed to generate and use RF energy for ISM, domestic or similar purposes, excluding application in the field of telecommunications. Assignments are not required to operate ISM equipment within the US&P, IAW the conditions outlined in Section 7.10 of the NTIA Manual.

6.27. Family Radio Service (FRS). FRS is a FCC unlicensed low powered service that provides coverage up to 2 miles using frequencies within the FRS frequency pool (see Table 6.3.). FRS radio may be used on any of the 14 FRS channels, which are shared between all FRS users. Thirty eight privacy codes allow the FRS users to limit the transmissions received to those users on the same channel and privacy code. This reduces confusion between multiple conversations on the same channel. A reminder that any FRS user can listen to any ongoing conversation and can legally break into that conversation. No FCC license or permanent frequency assignment is required and no FRS channel may be assigned to any specific individual or organization.

Table 4. FRS Frequency Pool.

| FRS Frequency Pool (MHz) | | | |
|---------------------------------|----------|----------|----------|
| 462.5625 | 462.5875 | 462.6125 | 462.6375 |
| 462.6625 | 462.6875 | 462.7125 | 467.5625 |
| 467.5875 | 467.6125 | 467.6375 | 467.6625 |
| 467.6875 | 467.7125 | | |

6.27.1. Federal government entities are authorized to purchase and operate radios certified by the FCC in the FRS pursuant to 47 CFR Part 95, Subpart B. Federal users will be accorded the same privileges as non-federal users. FRS users must share each channel and no user is assured protection from interference caused by another authorized user. AF FRS users may not purchase and operate FRS radios for planned communications operations that safeguard human life or property. AF FRS users must comply with the following conditions:

6.27.1.1. The provisions of 47 CFR Part 95 and Section 7.5.8 of the NTIA Manual.

6.27.1.2. Use of FRS devices outside the US&P is subject to host country and international regulations. AF members or employees are not authorized to use FRS radios outside the US&P without HN approval. Unified command directives apply. Coordinate FRS use with the appropriate AF component SMO.

- 6.27.1.3. AF members and employee users are responsible for all communications using FRS radio equipment. Use must comply with federal, state, and local law.
- 6.27.1.4. The installation commander may prohibit FRS when interference to mission essential EM equipment is anticipated or to resolve a suspected RFI problem.
- 6.27.1.5. AF members and employees using FRS radios must relinquish channel use for emergency communication messages concerning the immediate safety of life or the immediate protection of property.
- 6.27.1.6. Use only FCC certified FRS. Any modification to the equipment to boost power, add a different antenna, or to increase the gain of the current antenna, cancels the FCC certification and voids authority. Illegal FRS equipment is subject to confiscation.
- 6.27.1.7. FRS devices are not authorized for classified, sensitive but unclassified, command and control, squadron operational, aircraft/flight line maintenance, fire crash, explosive ordinance disposal, security forces, emergency/disaster response, tactical or training operations, and/or medical communications.
- 6.27.1.8. Under no circumstance will FRS radios be permitted for use in controlled areas without express written consent of the installation commander and full compliance with all security directives.
- 6.27.1.9. Use of FRS cannot be protected from harmful interference. FRS radios may not cause interference to any licensed device and must accept all interference from licensed devices.
- 6.27.1.10. The FCC may restrict use of the FRS radios if the station is located within the National Radio Quiet Zone (areas of MD, VA, and WV bounded by 39°15'N 78°30'W, 39°15'N 80°30'W, 37°30'N 78°30'W, 37°30'N 80°30'W).
- 6.27.1.11. AF members and employees assigned to non-appropriated fund activities and some appropriated fund activities may use FRS radios, as follows: to communicate with non-government users during AF supported or sponsored community activities, i.e., scouts, Special Olympics, youth activities/sporting events, civil disasters, funeral details for deceased military veterans, etc. In addition, FRS radios may be used for administrative purposes when communicating in warehouses, commissaries, base exchanges, billeting areas, work crews, etc. FRS radios may also be used on AF installations where the public is permitted entrance and in family housing areas.
- 6.28. Inter-Squad Radio (ISR). The ISR is the military FRS radio operating in the 380-399.975 MHz sub-band and is recommended over the commercial FRS for AF members and employees. Because it is in the government frequency band and the potential for EMI is less, it can be used for tactical or training operations unlike the FRS that uses civil spectrum. Other operations permitted with the ISR are cantonment areas and roving/walking guard posts. Unless appropriately encrypted, ISRs cannot be used to transmit classified, sensitive, command and control, fire/crash, security, and/or emergency response/medical communications. Refer to AFMAN 17-1302, *Communications Security (COMSEC) Operations*, for guidance on protecting these types of communication.

6.28.1. Do not modify the ISR.

6.28.2. Only AF members, employees, and contractors providing support to military operations will use the ISR.

6.28.3. ISR will not be used for personal business.

6.28.4. Possession and use of ISR devices outside the US&P is subject to host country and international regulations. AF members, employees, or contractors are not authorized to use ISR devices outside the US&P without HN approval. CCMD directives apply. Coordinate ISR use with the appropriate AF component SMO. Additional restrictions may be imposed in different AORs (i.e., Tactical and Training LMRs require National Security Agency type 1 encryption).

6.29. General Mobile Radio Service (GMRS). The GMRS is an FCC licensed personal two-way voice communications service used to facilitate the activities of an individual and their immediate family providing coverage up to 5 miles. GMRS cannot be used by government agencies under any circumstances.

6.30. Multi-Use Radio Service (MURS). The FCC established MURS in 2002 as a Citizens Band Radio Service. This equipment cannot be used by government employees in the line of duty, or as an employee of any government entity, including non-appropriated fund activities.

6.31. Terrestrial and Space Systems within Shared Bands. The following information applies to those bands between 1 GHz and 50 GHz equally shared by space and terrestrial services:

6.31.1. AFSMO determines whether a proposed fixed or mobile station in these bands will be within the normal coordination distance of an earth station listed in the NTIA Manual.

6.31.2. If the location is within the coordination distance, AFSMO coordinates the request with the agency operating the earth station.

6.31.3. Begin coordinating earth stations during the system review using procedures outlined in the NTIA Manual. Indicate on applications for frequency assignments the status of coordination with agencies that have terrestrial operations in the same band and within the coordination area of the earth stations.

6.31.4. AFSMO does not take final assignment action until national level coordination is complete.

6.32. Space and Balloon Systems. Include with each frequency request to radiate EM energy from spacecraft or balloon systems, either a detailed description of the methods for on-off telecommand capability, or a justified request for an exception.

6.33. Space-Ground Link Subsystem (SGLS) and Unified S-Band (USB). Satellite operations for military satellites are authorized for SGLS uplinks in the band 1761-1842 MHz and USB uplinks in the band 2025-2110 MHz and SGLS and USB downlinks in the band 2200-2290 MHz. Spectrum managers at Space and Missile Systems Center (SMC) located at Los Angeles AFB CA; Eastern Range (ER) located at Patrick AFB FL; and Western Range (WR) located at Vandenberg AFB CA manage and issue discrete frequency assignments on a program-by-program basis for all operations in these bands and coordinate

with Federal Satellite Operations (per DoD/NASA MOU, 23 October 2003) and also the Electronic News Gatherers for uplink operation in the 2025-2110 MHz band. **NOTE:** Dual-Band satellite operations policy requires shared AF, NASA, and National Oceanic & Atmospheric Administration (NOAA) operation in the 2025-2110 and 2200-2290 MHz bands.

6.34. Antenna Test on Frequencies Above 30 MHz. Applications for antenna testing should be IAW Section 8.2.23 of the NTIA Manual and include the following information in SFAF Item 520:

6.34.1. Effective radiated power. If unknown, give a reasonable estimate.

6.34.2. Profile of the surrounding terrain by description or other means. If testing within shielded enclosures, so state and give the attenuation (in dB) provided by the enclosure.

6.34.3. Antenna configuration, to include:

6.34.3.1. Whether full scale or less than full scale.

6.34.3.2. The estimated hours of use in local time (e.g., 0800 to 1700 daily, Monday through Friday; daytime only, Monday through Friday).

6.35. Requests for Restricted Frequencies. Except in unusual circumstances, do not ask for bands where regulations prohibit assignments (e.g., radio astronomy bands, standard frequency bands, some space bands, etc.). If a frequency is needed in a prohibited band, fully explain in SFAF Item 520 why operation is necessary in the prohibited band. Include type of service for which the antenna test is intended, (e.g., radiolocation, radionavigation, fixed, space). Give the government agency and contract number if testing supports a government contract. Explain the mission impact if you are not provided an assignment.

6.36. Line-Of-Sight Frequency Diversity (Use of multiple paired transmit and receive antennas operating at different frequencies). Justify the use of frequency diversity for new LOS transmission systems in 1780-1850, 2200-2290, 4400-4990, 7125-7250, 7300-7975, and 8025-8400 MHz bands. Explain the need for such a high degree of systems reliability and cite the engineering study showing that frequency diversity is necessitated by the required reliability. Existing systems using frequency diversity may continue until frequency congestion requires reevaluation.

6.37. Operating FCC-Licensed Stations on AF Installations.

6.37.1. CBs, amateurs, taxi companies, commercial entities, and other FCC licensed radio stations may transmit on AF installations but are subject to limitations imposed by the installation commander. Limitations should not unnecessarily infringe on the rights of the individual to operate a radio according to FCC Rules and Regulations (47 CFR Part 73, *Radio Broadcast Services*).

6.37.2. Based on need, commanders may require registration of FCC-licensed station operating on an AF installation. Registration instructions should be included within installation introduction materials.

6.37.3. If FCC licensed stations are involved in interference:

6.37.3.1. Report interference from a FCC licensed station to AF operations according to AFI 17-221. The installation commander may direct an on-installation offending

station to cease operations and will notify AFSMO, through host MAJCOM, of details of the action within 3 duty days. AFSMO will give this information, including action taken, to HQ FCC, Washington DC if appropriate, through the FCC Watch Officer.

6.37.3.2. Licensees report interference between two FCC licensed stations to the FCC Watch Officer.

6.37.3.3. Report AF operations interference to FCC licensed stations according to AFI 17-221.

6.37.3.4. The FCC resolves interference by a FCC licensed station to the reception of commercial broadcast stations or the use of home entertainment units. Victims of such interference report the problem to the FCC Watch Officer.

6.38. Link-16, formerly known as Joint Tactical Information Distribution System (JTIDS)/Multifunctional Information Distribution System (MIDS). Link-16 is the nomenclature for terminals used in a Link-16 terminal network. Link-16 utilizes Time Division Multiple Access (TDMA) to provide integrated communications, navigation, and platform identification. Link-16 enables secure, jam-resistant, tactical, radio navigation and communications with low probability of intercept and jamming between ground-based (fixed and mobile), ship, and airborne platforms. When not transmitting, each terminal can receive information broadcasted by other terminals in the area. Link-16 terminals use message time-of-arrival (TOA) information, broadcast position data, and multilateration techniques to determine their own location. Link-16 terminals operate from 969 MHz to 1208 MHz using 51 hopped carrier frequencies with a maximum power of 200 watts. The carriers exclude the IFF communication bands centered at 1030 MHz (transponder receiver) and at 1090 MHz (interrogator receiver). Additionally, by January 2025, all fielded Link-16 terminals will be capable of remapping up to 14 frequencies, refer to NTIA Manual para 4.3.17.

6.38.1. Users will process Link-16 frequency requirements through command channels to AFSMO. All Link-16 frequency actions, including waivers for time slot duty factors (TSDF), will be coordinated at the national level with the FAA through NMSC. A Link-16 worksheet is required for temporary and new permanent requirements, frequency proposals will be coordinated via SXXI. Permanent frequency requests follow the normal IRAC/FAS process and require a minimum of sixty (60) business days lead time. Once FAA approved, temporary authorizations will be entered into the FRRS only.

6.38.2. Link-16 Terminals. Link-16 terminals operate within the frequency band allocated worldwide for aeronautical radionavigation. The FAA controls use of this band in the US&P. The DoD must operate within the strict guidelines set by the FAA to ensure flight safety.

6.38.3. Frequency assignments and operations must be in strict adherence to Chairman of the CJCSI 6232.01 (Series), *LINK-16 Spectrum Deconfliction*, and ACP 190 US SUPP-1 (D), Annex F, *LINK-16 Coordination Procedures*.

6.39. Station Keeping Equipment (SKE) (AN/APN-169 & AN/APN-243). SKE provides transport aircraft (C-130) the ability to fly safely in close formation in all weather. This is accomplished by presenting the aircrew with a situational display that shows the relative position of the other formation members in reference to the lead aircraft and alerts the crew

via audiovisual proximity warning when aircraft come too close to each other. The system transmits high-powered pulses on one of four frequencies (3350, 3390, 3470, 3510 MHz).

6.39.1. The AMC Tanker Airlift Control Center (TACC) SMO maintains four frequency assignments for SKE usage within the US&P. The TACC SMO deconflicts SKE usage to ensure safe passage of multiple formations and drop zones.

6.39.2. Station Keeping Equipment Follow-On (SKEFO) (AN/APN-243A) provides transport aircraft the ability to fly safely in close formation in all weather. The system allows interoperation of up to 100 aircraft in 100nmi range, utilizing a low probability of detection spread spectrum waveform in the 3100-3600 MHz band. The frequency hop set is programmable based on HN authorizations. Multiple hop sets may be loaded in to the system depending on each nation's authorizations. The lead aircraft coordinates the manual switching of the hop sets at country borders. When used with the zone maker (AN/TPN-027B), the SKEFO system operates in high-powered pulsed mode on one of four fixed channels and the system provides for precision guidance to the drop zone.

6.40. Single Channel Ground and Airborne Radio System (SINCGARS). The AF acquires ground SINCGARS radios from the Army. This program encompasses the following program elements: Airborne SINCGARS Jam Resistant VHF radio (AN/ARC-222) and the Ground SINCGARS Jam Resistant VHF Communications. The increased usage of tactical Unmanned Aerial Systems (UAS) and other Airborne Communications Node platforms requires a thorough understanding of the request procedures as well as potential limiting factors when considering employing the SINCGARS radio in ground based and/or airborne-based operations, hopping or non-hopping mode. The guidance below applies to CONUS only.

6.40.1. Ground-Based SINCGARS. The objective of ground SINCGARS is to obtain a jam-resistant VHF ground radio capability.

6.40.1.1. Hopping and Non-hopping Modes. Frequency assignments and coordination for use are subject to the spectrum resources available in the local area.

6.40.2. Airborne Based SINCGARS. The objective of Airborne SINCGARS is to achieve a jam-resistant VHF voice radio capability for AF aircraft.

6.40.2.1. Hopping mode:

6.40.2.1.1. 30-88 MHz - Below 1,000 feet elevation AGL, hopping operations are coordinated with the supporting AFC.

6.40.2.1.2. 30-54 MHz - Above 1,000 feet elevation AGL, all frequencies must be coordinated with the supporting AFC.

6.40.2.1.3. 54-88 MHz - Above 1,000 feet elevation AGL, the SINCGARS hopping mode may be permitted at selected sites within CONUS. Use can potentially interfere with commercial television, operational use is based on a case-by-case noninterference basis. This requires national level coordination with the FCC through proper frequency management channels. Refer to NTIA Manual for sub-bands authorized for usage when training with ground-based SINCGARS.

6.41. Military Aircraft Collision Avoidance System (MILACAS). MILACAS is the current generation technology version and replacement of Traffic Alert and Collision Avoidance

System (TCAS) and Enhanced Traffic Alert and Collision Avoidance System (ETCAS). The system has advanced surveillance functions to support improved overall performance. MILACAS-FR supports improved TCAS performance and extended range coverage, while MILACAS-FR supports formation rendezvous capability utilizing Mode “S” data link and ultimately replacing SKE on C-130 and C-17 platforms.

6.42. Airborne IFF (AIFF). Within the US&P, the FAA requires airborne IFF/SIF systems, interrogators and transponders (1030/1090 MHz) be Air Traffic Control Radar Beacon System, Identification Friend or Foe, Mark XII/Mark XIIA, Systems (AIMS) certified and obtain spectrum supportability (refer to NTIA Manual, para 10.8.4 and ACP-190 US SUPP 1(D), Annex D), and frequency assignments through the NTIA before employment. Non-certified IFF systems may require an AIMS Letter of Recommendation for FAA coordination along with a frequency assignment request. AIMS support can be obtained by contacting the AIMS SPO at email: dod.aimspo.wkflo@us.af.mil. Each specific mode of operation (Modes 1, 2, 3A/C, 4, 5, & S) being employed must have frequency authorization. All Mode 4 requirements must be processed through AFSMO to the DoD Mode 4 Coordinator and all Mode 5 requirements must be processed through AFSMO to the national level FAA SMO.

6.43. HAVE QUICK. The basic HAVE QUICK radio is a single channel UHF radio system modified to include a slow frequency hopping capability to counter jamming threats encountered in the early 1980s. During the mid to late 1980s, HAVE QUICK II evolved as a minimal cost modification of the basic HAVE QUICK that provided additional anti-jam protection, improved frequency hopping algorithms, and expanded hopsets. With an anticipated increase in jamming threats in the late 1980s and in an effort to refine the system’s capabilities, the development of HAVE QUICK IIA was initiated. HAVE QUICK IIA was designed to provide faster frequency hopping rates, additional hopset capability resulting from narrower channel bandwidth, and support for the transmission of digital data. Per STANAG 4372, HAVE QUICK IIA was designated as SATURN, the Second-generation Anti-jam Tactical UHF Radio for NATO. Although the US supports STANAG, SATURN remains an unfunded requirement and is not presently part of our radio inventory. The AF uses many different types of equipment for HAVE QUICK operations. For example: (AN/ARC-164/171/204/210/215/225; AN/GRC-171B (V) 4/206(V) 3/240; AN/PRC-113; AN/TRC-176; AN/TSQ-198; AN/URC-98A/99A; AN/VRC-83 (V) 3). Frequencies for AF operations are set-aside in Annex C of the MC4EB 225-399.9 MHz channeling plan for HAVE QUICK I and HAVE QUICK II operations. Additional information for HAVE QUICK requirements can be found in AFTTP (I) 3-2.49, *Multi-Service Tactics, Techniques, and Procedures for HAVE QUICK Radios*.

6.44. Commercial Satellite Communications. The use of commercial satellite services is becoming more and more prevalent within DoD. DoD policy and guidance are described in CJCSI 6250.01E, *Satellite Communications*.

6.44.1. Once the requirement is defined the type of radiocommunication service must be identified. These services are either Fixed Satellite Service (FSS) or Mobile-Satellite Service (MSS).

6.44.1.1. FSS uses fixed earth stations and one or more space stations to route radio signals between fixed locations. FSS provides users with a leased transponder from a commercial satellite provider.

6.44.1.1.1. Refer to ACP 190 US SUPP 1 (D), Annex I, *DoD Spectrum Procedures for the Use of Commercial Satellite Earth Terminals Outside United States and Possessions*, for procedures and guidance regarding DoD users of earth terminals utilizing commercial FSS outside of the US&P.

6.44.1.1.2. Users must contact DISA, through command channels, for guidance on leased FSS under the DISN Satellite Transmission Services – Global (DSTS-G) contract.

6.44.1.2. MSS provides for communications between mobile earth stations by means of one or more space stations. (A mobile earth station is an earth station operating while in motion on land, at sea or in the air, or when halted at an unspecified location.) MSS provides users a service at a monthly fee similar to telephone service.

6.44.1.2.1. Refer to DoD CIO successor to Assistant Secretary of Defense/Command, Control, Communications and Intelligence (ASD(C3I) and ASD/Networks and Information Integration (ASD(NII)) Policy Letter, *DoD Policy Letter on Managing MSS*.

6.44.1.2.2. Since the DoD is considered as just another user, the service provider is responsible for all spectrum supportability issues, including HN coordination.

6.44.1.3. In some cases, the FSS and the MSS include satellite-to-satellite links, which also may be operated in the Inter-Satellite Service (ISS). Also, these services may include feeder links necessary for their operation.

6.44.2. All equipment used to access a commercial satellite must conform to FCC Rules and Regulations (47 CFR Part 25). One of two situations must apply. Either the government owns and operates the terminal equipment, or the terminal equipment is leased.

6.44.2.1. If the equipment is leased or commercially owned, the commercial provider is responsible for securing FCC Part 25 certifications and the frequency assignments.

6.44.2.2. If the equipment is DoD owned, DoD must request Part 25 certification in order to obtain spectrum certification. When processing the EL CID file, the user must also submit the information in Table 5.

Table 5. FCC Part 25 Certification.

| | |
|--|--|
| Operational Description | Include an operational description and any supporting information you feel the FCC may need to understand your use. |
| FCC Radio License | If the assignment was supported by a commercial license, include the owner of the license, locations authorized on the license, the call sign, and the file number. |
| Location of Earth Station | Include the site ID, city, state, coordinates, and site elevation (meters) for each earth station. NOTE: The site ID is a name used to identify a specific earth station. This name will be used any time the site ID is requested. |
| Points of Communications | Include the satellites you desire to use and their location. NOTE: If the requirement will be for any US domestic satellite, you may enter ALSAT (All US Domestic Satellites). |
| Destination Points for Communications Using Non-US Licensed Satellites | Include the satellite name and all destination points for any requirements using non-US satellites. |
| Earth Station Antenna Facilities | Include the site ID; antenna ID, quantity, manufacturer, model, antenna size (meters), and the antenna transmit/receive gain (___dB referred to an Isotropic Antenna [dBi] at _____GHz) for all earth station antennas. NOTE: As with the site ID, the antenna ID is also a name used to identify a particular antenna and will be used any time the antenna ID is requested. |
| Operational Description | Include an operational description and any supporting information you feel the FCC may need to understand your use. |
| | |
| Antenna Heights and Maximum Power Limits | Include the antenna ID, maximum antenna height AGL (meters), maximum antenna height above mean sea level (meters), building height AGL (meters), maximum antenna height above rooftop (meters), total input power at antenna flange (watts), and total Effective Isotropic Radiated Power (EIRP) for all carriers (dB referred to 1 Watt [dBw]) for all antennas. |
| Frequency Coordination Limits | Include the antenna ID, frequency limits (MHz), range of satellite arc eastern limit, range of satellite arc western limit, antenna elevation angle eastern limit, antenna elevation angle western limit, earth station azimuth angle eastern limit, earth station azimuth angle western limit, and maximum EIRP density toward the horizon (dBw/4kHz) for all antennas. |
| Particulars of Operation | Include the antenna ID, frequency bands (MHz), mode of operation (transmit/receive), antenna polarization (H, V, L, R), emission designator, maximum EIRP per carrier (dBw), maximum EIRP density per carrier (dBw/4kHz) and a description of the modulation for all antennas. NOTE: All frequency bands and all emission designators must be listed for each band. |

6.44.2.3. The FCC requires the following information for federal government use of commercial satellite spectrum:

6.44.2.3.1. A letter of acceptance or agreement from the satellite service provider.

6.44.2.3.2. A letter from the commercial satellite regional coordinator (for the earth station location) that indicates the earth station operations are accepted.

6.44.2.3.3. Documentation that the earth station terminal complies with Part 25.

6.44.2.3.4. A letter of request from the federal agency for use of the commercial spectrum (it must include the information in Table 6.4.).

6.44.3. Use outside of the US&P is subject to restrictions set forth by HN governments. Equipment use must be coordinated through the appropriate spectrum management channels. Users must verify HN supportability for equipment use and satellite service before deploying overseas with the service.

6.45. Commercial Mobile Satellite Services (MSS) - Provide full-duplex, half-duplex, and simplex communications services, which support any type of digital telephone transmission. These commercial systems complement DoD communications resources and are standalone terminals that can only be used on one system; for example, an Iridium® phone may only be used in the Iridium® system. MSS systems are primarily on-demand, first-come, first-served communications. They often operate, but not exclusively, on frequencies at 3 Gigahertz (GHz) or below. Types of systems include, but are not limited to, Iridium® and Inmarsat™.

6.45.1. Operations in Foreign Countries. Commercial satellite operations in foreign locations require Host Nation Approval (HNA), Terminal Licenses/Certifications, Frequency Clearances (FCs), and/or Landing Rights (LRs). When a mission partner plans to use satellite bandwidth or equipment in foreign countries, it is required to follow the laws of the host nation when operating in the commercial spectrum. DoD or US policy does not supersede the laws of the host nation. Failure to get HNA equates to no protection from interference, possible interception, and potential violation of international and local laws (which could result in fines, seizure of equipment, and creating an “international incident”).

6.45.2. Inmarsat™, a commercial satellite communications company, owns and operates a fleet of L-band and Ka-band satellites providing mobile voice and data communications capability. The Inmarsat™ terminal is a radio communications device using a satellite link to interface with terrestrial telephone systems or other Inmarsat™ terminals. For procurement of Inmarsat™ hardware assets and associated services refer to AFI 17-213, *Warfighting Integration Satellite Communications Resource Management*.

6.45.3. Iridium®/Enhanced Mobile Satellite Service (I/EMSS) - an L-band satellite constellation which provides a global wireless personnel communications network designed to permit narrow-band wireless transmission, (i.e., voice, data, fax, or paging), to reach its destination with a minimum reliance on land-based infrastructures. Cross-linking between satellites and up/down-linking through the DoD terrestrial satellite gateway at Wahiawa, Hawaii, enables DoD users DSN secure/non secure and commercial global access and coverage capability. Per DoD CIO policy, Iridium® is approved for use as a commercial leased service without a waiver. Neither spectrum

certification nor frequency assignments are required; however, special procedures exist for the purchase and use of Iridium® service and equipment. For procurement of Iridium® hardware assets and associated services refer to AFI 17-213.

6.45.4. Users must contact AFNIC/ECWM and DISA, through command channels, for guidance. Refer to AFI 17-213 for procedures regarding MSS resources. Refer to DISA Circular 310-130-1, *Submission of Telecommunications Service Requests*, for the provisioning procedure.

6.45.5. Use outside of the US&P is subject to restrictions set forth by HN governments. Equipment use must be coordinated through the appropriate spectrum management channels. Users should contact AFNIC/ECWM to determine whether the HN has authorized the use of Iridium®. Contact the Iridium® POC to negotiate HN approval coordination.

6.46. Frequency Requests in Canada or along the US/Canadian Border. The US and Canada have made arrangements to coordinate frequency requests for radio transmitters operating close to both countries. AFSMO obtains licenses using the data from frequency actions sent by the MAJCOMs. Include in SFAF Item 520 the approximate number of civilian and military personnel assigned to the radio station on a yearly basis that directly operate and maintain transmitter and receiver stations.

6.47. Permanent and Temporary Assignments. The US and Canada have made arrangements to coordinate frequency requests for radio transmitters operating in Canada or near the US/Canadian border. These arrangements are documented in Section 3.4 of the NTIA Manual. All assignments required for longer than ninety (90) days that conform to the arrangements will be coordinated by the IRAC with Industry Canada (IC).

6.47.1.1. Assignments for AF Radio Stations in Canadian Territory. The Canadian Government (in agreement with the US Government) licenses US military radio stations in Canada. The Canadian-US defense agreement must authorize each station; however, these radio stations do not need individual licenses.

6.47.1.1.1. The following procedures apply to US military activities within Canada:

6.47.1.1.2. A Canadian-US defense agreement must authorize each installation or activity.

6.47.1.1.3. US military radio stations that support a US activity need a Canadian license.

6.47.1.1.4. Multiple equipment installations, such as communications complex transmitter sites, are licensed as individual stations.

6.47.1.1.5. Airborne radio stations do not need a Canadian license for communications with a licensed ground station, but do require frequency coordination and approval from the Canadian Frequency Allocation Coordinating Subcommittee and the Joint Telecommunications Committee for airborne radio operations. AFSMO processes the coordination and clearance through the MC4EB FP for AF airborne radio stations operating in Canada.

6.47.1.1.6. Licenses issued to parent fixed stations include associated vehicular

radio stations.

6.47.1.2. STAs. All Special Temporary Authorizations (STA) for 90 days or less will be coordinated by AFSMO with the National Defense Headquarters, Ottawa, Canada.

6.48. Mutual Aid. When the equipment is owned by the civil agency and is given to the government agency for the purpose of mutual aid, a government frequency assignment does NOT require entry into the GMF. However, corresponding assignment(s) will be entered into FRRS with a copy of the mutual aid agreement maintained on file. When the government entity owns fixed station equipment and the purpose of the frequency usage is "mutual aid," then the frequency assignment must be registered into the GMF. Government owned mobile or portable assets, unless used in a fixed station mode that is specifically intended to provide "mutual aid" support under a licensed non-federal government fixed station operating environment, does not have to be registered into the GMF. During the registration process, the FCC performs coordination required in the NTIA Manual. In addition, a Letter of Agreement must be on file and have been signed by the non-federal government or government parties requesting the aid agreement.

6.49. Spectrum support for RF-Dependent Foreign Military or Direct Commercial Sales (FMS/DCS). Before AF spectrum support can be provided, a determination must be made by the FMS officer and the program manager that AF spectrum support is required. This determination depends in part on how the sale is being processed.

6.49.1. Foreign Military Sales (FMS). With regard to FMS, if the US government owns the equipment and will transfer the equipment directly to a foreign government, but has never operated the equipment in the US&P and never intends to operate the equipment in the US&P, then no DD Form 1494 is required and the US government may apply for a temporary frequency assignment. The frequency proposal application will clearly state, using S-Note 303, that there is no intent to use the equipment in the US&P and a remark in SFAF Item 503 should state: "FMS." If the US government owns the equipment and has operated or intends to operate the equipment in the US&P, then the NTIA spectrum certification and frequency assignment process must be followed. If the equipment is currently in the AF inventory there should be an existing DD Form 1494 or EL CID file already on file.

6.49.2. Direct Commercial Sales (DCS). If a US manufacturer owns the platform to be transferred directly to a foreign government, that process is called DCS. Unlike FMS sales, DCS are negotiated directly between the foreign government and the US manufacturer without the Pentagon serving as an intermediary. The equipment involved is typically slightly different from the equipment that same US manufacturer built for or sold to the US government. The US manufacturer must obtain any required spectrum support from the FCC for developmental and operational tests, if needed. Essentially, neither the US manufacturer nor the foreign government intends to operate the equipment within the US&P on a permanent basis.

6.49.3. However, there exists a hybrid scenario whereby a US manufacturer makes a sale to a foreign government via the DCS process with FMS support. The foreign government is accepting equipment directly from the US manufacturer but training on that equipment will occur in the US&P through a DoD SPO. For example, US- type aircraft/equipment being sold to an allied country with training on that new aircraft/equipment being

provided by the USAF. These equipment may have RF- dependent equipment on board that operates similarly to that of the AF. In these instances, spectrum support must be obtained through AF channels for developmental testing and eventually, operational testing and training.

6.49.4. AFSMO will challenge ownership on all “Experimental/Temporary” frequency assignment proposals. If the AF does not have clear ownership, then AFSMO will ask for clarification.

6.50. Contractor-Owned Equipment. IAW the guidelines contained in Section 8.2.17 of the NTIA Manual, a determination must be made as to whether or not a station belongs to and is operated by the US as specified in Section 305(a) of the Communications Act of 1934. If the station is not under the effective control of a federal department or agency, the contractor must seek approval to operate on federal property and obtain spectrum support according to the FCC and provision of para 8.2.47, Shared Federal/Non-Federal Radio Systems, of the NTIA Manual.

6.50.1. If the AF has accepted and taken possession/ownership of the equipment then the AF must apply for spectrum support through the NTIA process. If the equipment is being manufactured under direct AF contract, the AF must provide spectrum support through the NTIA process.

6.50.2. If the equipment being supported is not in direct support of an AF contract, then the contractor must apply to the FCC for the license to develop/test/operate the equipment.

6.51. Land Mobile Radio (LMR) 30-88, 138-144, 148-150.8, 162-174, 380-399.9, and 406-420 MHz. Because of extreme congestion in the 162-174 MHz band, new LMR frequency assignments are usually made in the 138-144, 380-399.9, or 406.1-420 MHz bands unless use of another band is needed for operational reasons. No one solution works everywhere; therefore, to ensure LMR frequencies are available before deploying equipment overseas, MAJCOMs must contact the appropriate service component for guidance. The following conditions, restrictions and special provisions apply:

6.51.1. The 29.89-50 MHz band. Refer to the *Supplement to Manual of Regulations and Procedures for Federal Radio Frequency Management*, August 2009. Government and non-government agencies share this band and available frequencies are very limited. Frequency channels begin with 29.90 MHz and move up the band in 20 kHz increments.

6.51.2. The 138-144 MHz band. The military services are the primary users in this band. Channels begin with 138.0125 MHz and move up the band in 12.5 kHz increments.

6.51.2.1. All equipment in this band must operate within a 12.5 kHz narrowband channel.

6.51.3. 148-150.8 MHz band. This band is allocated for non-government mobile-satellite (earth-to-space) operations, on a shared basis with government stations.

6.51.3.1. All equipment in this band must operate within a 12.5 kHz narrowband channel.

6.51.4. 162-174 MHz band. Refer to the *Supplement to Manual of Regulations and Procedures for Federal Radio Frequency Management*, August 2009. This band is used

primarily by non-military government agencies. AF users will satisfy new LMR and pager requirements from other frequency bands. Channels begin with 162.000 MHz and move up the band in 12.5 kHz increments.

6.51.4.1. All equipment in this band must operate within a 12.5 kHz narrowband channel.

6.51.4.2. AF assignments in the 162-174 MHz band are only made when:

6.51.4.2.1. The frequency is needed for dual-channel operation with an existing net.

6.51.4.2.2. The frequency of an existing net must be changed because of interference problems.

6.51.4.2.3. An existing assignment is shared with another unit at the same location.

6.51.5. The 406.1-420 MHz band. Refer to the *Supplement to Manual of Regulations and Procedures for Federal Radio Frequency Management*, August 2009. This band is used primarily by non-military agencies. Channels begin with 406.0125 MHz and move up the band in 12.5 kHz increments.

6.51.5.1. All equipment in this band must operate within a 12.5 kHz narrowband channel.

6.51.6. Off-channel Assignment. AF users will adjust existing off-channel assignments within the US&P that do not conform with the MC4EB channeling plan (e.g., 148.065 or 150.195) as soon as possible.

6.51.6.1. Spectrum managers at all levels should look for practical, economical opportunities to realign such off-channel frequency assignments.

6.51.6.2. The following special provisions apply to AF users of LMR frequencies not conforming to the MC4EB channeling plan:

6.51.6.2.1. When an AF unit is planning to replace off-channel equipment, the commander must determine whether to obtain an on-channel frequency assignment before the equipment is ordered.

6.51.6.2.2. When an off-channel LMR net is receiving interference from an on-channel system and a frequency change is the most economical way to solve the problem, change the off-channel net.

6.51.6.2.3. If all the equipment on an off-channel net is turned in, delete the frequency assignment immediately. Do not reserve the off-channel frequency assignment for a new unit.

6.52. Narrowbanding. AF owned or leased LMR systems operating in the US&P in the bands in the 138-150.8, 162-174, 380-399.9, and 406.1-420 MHz bands must be narrowband capable. Any AF system that is not narrowband compliant will operate on a NIB to all other narrowband users.

6.53. Trunked Land Mobile Radio (TLMR) Systems. All TLMR systems require SPS approval prior to the application for frequency assignment. Installation of a TLMR requires

consolidation of all TLMR nets. Federal agencies managing TLMRs shall allow access by other federal agencies where such access is technically and operationally feasible. All TLMR proposal requests for operation in the US&P must include a current SPS and IRAC docket number. Delete conventional frequencies as you receive approval for the new narrowband frequencies.

6.54. Receive-Only Systems. Though these systems do not require MC4EB coordination, if interference protection is required then submit a DD Form 1494 via HNSWD-O for O'CONUS or anEL CID file for US&P to:

6.54.1. Provide interference protection, update SXXI, and conduct EMC studies.

6.54.2. Process coordination contours for the NTIA Manual for operational (Stage 4) receive-only satellite communications terminals.

6.54.3. Coordinate spectrum requirement through CCMD channels via Host Nation Spectrum Worldwide Database-Online (HNSWD-O).

6.55. Commercial Antennas on Federal Property. Commercial vendors may request the installation of commercial antennas on AF property. To ensure no adverse impacts to DoD systems, commanders and/or agency directors shall coordinate requests through the Base Civil Engineering Real Property Office for the placement of new telecommunications services on AF property. The vendor will provide information to JSC for an EMI radiation hazard analysis at their own expense. The ISM may facilitate in these procedures. Refer to AFI 32-9003 for additional information.

6.56. Built-In Test Equipment. With the exception of GPS re-radiating equipment, this equipment does not require spectrum certification unless it exceeds the technical criteria in the NTIA Manual or if the intended use is outside the US&P. Frequency assignments are required for built-in test equipment.

6.57. Electronic Warfare (EW). EW is a military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. EW consists of three aspects: electronic attack (EA), electronic protection (EP), and electronic warfare support (EWS).

6.57.1. EW, in general, and EA, in particular, is not recognized as an authorized service by the National Level approval authority, (i.e. NTIA and FCC). Additionally, there are strict controls for the use of frequency bands controlled or shared with the FAA because of safety-of-life issues relating to commercial aviation flight routes and terminals. With proper coordination, EA may be performed under the condition that harmful interference will not be caused to authorized services.

6.57.2. Performing EA for Testing, Training and Exercises in the U.S. and Canada. Frequency bands are not allocated for EW operations, testing or training. Therefore, it will be necessary to coordinate planned EW testing and training events using the EA approval process defined in CJCSM 3212.02 (Series), *Performing Electronic Attack in the United States and Canada for Tests, Training, and Exercises*, and CJCSM 3212.03 (Series), *Performing Tests, Training, and Exercises Impacting the Global Positioning System (GPS) in the United States and Canada*. These procedures are recognized by the

NTIA as the official guidance for coordination and frequency clearance procedures for performing EA.

6.57.3. AFSMO is the Air Force approval authority for EA and jamming requests for AF EW events within the US&P and Canada. EA requests for frequency clearance outside of the US&P and Canada is accomplished by submitting the EA request according to theater policies and procedures.

6.58. Commercial off-the-Shelf (COTS). COTS devices, as defined by 48 CFR 12.103, including devices with FCC Type Acceptance, require spectrum supportability either through the NTIA SPS or MC4EB process. Not all COTS devices are considered non-licensed devices; **Chapter 10** of the NTIA manual denotes the factors for determining which stage of system review is required. COTS devices require a frequency assignment to be registered in the GMF and/or the DoD FRRS. Note: The use of aeronautical COTS systems will bring significant risks associated with the use of these products in a military environment. Mission characteristics must be taken in consideration before procuring and placing these systems into operation.

7. Windmill Operations.

7.1. The advent of large (250-foot-tall and greater) wind turbines, or “windmills” for power production has raised the issue of possible effects on the performance of ATC radars. Windmills with heights up to 700 feet above ground level are being installed on sites throughout the United States. As noted in the NTIA Technical Report TR-08-454, *Assessment of the Effects of Wind Turbines on Air Traffic Control Radars*, radar reflections can mask the true radar return. <http://www.its.bldrdoc.gov/pub/ntia-rpt/08-454/>.

7.2. Due to potential flight obstruction concerns, windmill site developers are required to coordinate proposed site locations near or close to ATC facilities with the FAA. Para 7.2.1 describes the coordination process with potentially affected MAJCOMs become aware of proposed windmill sites within their area of operations.

7.3. In addition to the FAA Web Portal notification process outlined in AFI 90-2001, AFSMO receives notifications from the NTIA and in turn forwards to all affected MAJCOMS. If a MAJCOM Encroachment Committee has concerns regarding the proposed location of a wind turbine site, it will return a proposed rebuttal and contact information via AFSMO. The NTIA will compile concerns and prepare an official Response Letter to the Windmill developer. As required, the involved MAJCOM/Installation Encroachment Committee may engage the Windmill developer to resolve conflicts. If the MAJCOM cannot resolve the identified concerns with the Windmill developer, then these concerns should be elevated to HAF for assistance.

8. Electromagnetic Spectrum Data Sharing

8.1. The EME is a critical shared joint-use environment that must be effectively controlled in order to enable successful military operations. In order to effectively share spectrum data, it must be timely, comprehensive, relevant, accurate, and trusted.

8.2. DoDI 8320.05, *Electromagnetic Spectrum Data Sharing*. Establishes policy, assigns responsibilities, and provides procedures for the collection, provision, maintenance, and

sharing of timely, comprehensive, relevant, accurate, and trusted data used to characterize SD systems and define the EME.

8.3. Electromagnetic Spectrum Data Community of Interest (COI): A COI is a strategic approach for developing the agreements necessary for meaningful information exchange, and doing so collaboratively across the community of stakeholders who share a common interest. The spectrum data COI is established and functions, IAW DoD 8320.02-G, *Guidance for Implementing Net-Centric Data Sharing*, to ensure spectrum-related data identification, standardization, collection, provision, and maintenance is provided for meeting the needs of the DoD.

8.4. AF spectrum stakeholders and SD system developers shall:

8.4.1. Implement procedures to ensure that all data generated at each stage of the spectrum certification process is complete, accurate, and in conformance with published spectrum-related data standards. (T-0)

8.4.2. Ensure that all spectrum-related data for SD system(s) is submitted via the DoD data capture describing supportability tracking and data maintenance capabilities throughout the SD system life cycle. (T-0)

8.4.3. Provide AFSMO with operational lessons learned and spectrum-related data feedback.

8.4.4. Ensure that all current and future spectrum-related data assets are made consistent with DoDI 8320.05.

9. Electromagnetic Spectrum Reallocation

9.1. In 2010, the Secretary of the Air Force directed the AFSMO to create and standardize a process for all federal spectrum reallocation events. In response, an Air Force Smart Operations for the Twenty-First Century (AFSO21) event was held that brought together stakeholders from the operations, intelligence, logistics, spectrum, acquisition, program management, cost, and joint communities. The output of the AFSO21 event was a standard model to effectively identify every SD system and mission that can be impacted by the reallocation of spectrum.

9.1.1. Reallocation is a change to the “U.S. National Table of Frequency Allocations.” A reallocation event could impact any frequency band that is currently allocated as exclusively “federal” spectrum, redesignating it to exclusively “non-federal” spectrum (i.e., commercial use only and a complete loss of Air Force licensed access).

9.1.2. Alternatively, a reallocation event could change the status of some portion of the spectrum from exclusively “federal” to “shared–federal/non-federal.” The Air Force, DoD and other federal agencies would then be required to share a frequency band or bands with commercial users under a regulatory sharing agreement or relative status (primary, co-primary or secondary) in a licensing arrangement.

9.1.3. Pursuant to federal law, special conditions apply to DoD use of the spectrum. These conditions may impact attempts to reallocate spectrum when the DoD is the primary user of that spectrum. See the NTIA Manual, Section 2.3.13 for further information.

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

5 USC 552, *Public Information; Agency Rules, Opinions, Orders, Records, and Proceedings*

10 USC **Chapter 909**, *Civil Air Patrol*

47 USC **Chapter 5**, Section 151 et seq., *The Communications Act of 1934*

47 CFR 15, *Radio Frequency Devices*

47 CFR 18, *Industrial Scientific and Medical Equipment*

47 CFR 25, *Satellite Communications*

47 CFR 73, *Radio Broadcast Services*

47 CFR 95, *Personal Radio Services*

47 CFR 95.191, *Eligibility and Responsibility*

47 CFR 95.192, *Authorized Locations*

47 CFR 95.193, *Types of Communications*

47 CFR 95.194, *FRS Units*

Office of Management and Budget Circular (OMBC) No. A-11, Part 2, Section 31.12, *Radio Spectrum-Dependent Communications-Electronics Systems*

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AFI 17-221, *Spectrum Interference Resolution Program*, 22 Dec 2015

AFI 10-2701, *Organization and Function of the Civil Air Patrol*, 31 July 2014

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AFI 16-1404, *Air Force Information Security Program*, 29 May 2015

AFI 32-9003, *Granting Temporary Use of Air Force Real Property*, 19 August 1997

AFI 90-2001, *Encroachment Management*, 2 September 2014

AFMAN 17-1202, *Collaboration Services and Voice Systems Management*, 6 September 2012

AFI 17-213, *Warfighting Integration Satellite Communications Resource Management*, 14 January 2015

AFMAN 17-1302, *Communications Security (COMSEC) Operations*, 3 September 2014

AFI 17-210, *Radio Management*

AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*, 1 August 2014

AFI 91-208, *Hazards of Electromagnetic Radiation to Ordnance (HERO) Certification and Management, Change 1*, 14 November 2013

AFI 91-203, AFGM3, *Air Force Consolidated Occupational Safety Instruction*, 19 August 2014

AFMAN 33-363, *Management of Records, Change 1*, 9 April 2015

Prescribed Forms

None

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

DD Form 1494, *Application for Equipment Frequency Allocation*

USMCEB Pub 7, *Standard Frequency Action Format (SFAF)*

Abbreviations and Acronyms

AAG—Aeronautical Assignment Group

AC&W—Aircraft Control and Warning

ACP—Allied Communications Publication

ADS-B—Automatic Dependent Surveillance-Broadcast

AETC—Air Education and Training Command

AF—Air Force

AFAUX/CAP—Air Force Auxiliary/Civil Air Patrol

AFC—Area Frequency Coordinator

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFMC—Air Force Material Command

AFNIC—Air Force Network Integration Center

AFPD—Air Force Policy Directive

AFRIMS—Air Force Records Information Management System

AFSIR—Air Force Spectrum Interference Resolution

AFSMO—Air Force Spectrum Management Office

AFSPC—Air Force Space Command

AFTRCC—Aerospace and Flight Test Radio Coordinating Council

AGL—Above Ground Level

AIMS—Air Traffic Control Radar beacon System, Identification Friend or Foe, Mark XII/Mark XIIA, Systems

AM—Amplitude Modulation

ANG—Air National Guard

ANGRC—ANG Readiness Center

AOR—Area of Responsibility

ASOS—Automated Surface Observation System

ASR—Airport Surveillance Radar

ATC—Air Traffic Control

ATIS—Automatic Terminal Information System

AWOS—Automated Weather Observation System

CB—Citizen Band
C-E—Communications-Electronics
CFR—Code of Federal Regulations
CJCSI—Chairman of the Joint Chiefs of Staff Instruction
CJCSM—Chairman of the Joint Chiefs of Staff Manual
CCMD—Combatant Command
CONUS—Continental United States
COTS—Commercial-off-the-Shelf
DAO—Defense Attaché Office
dB—Decibel
dB_i—dB referred to an Isotropic Antenna
dB_w—dB referred to 1 Watt
DCS—Direct Commercial Sales
DII—Defense Information Infrastructure
DISA—Defense Information Systems Agency
DME—Distance Measuring Equipment
DoD—Department of Defense
DoDD—Department of Defense Directive
DoDI—Department of Defense Instruction
DOT—Department of Transportation
DSN—Defense Switched Network
DSO—Defense Spectrum Organization
DSP—Defense Standardization Program
E-mail—Electronic Mail
EA—Electronic Attack
EIRP—Effective Isotropic Radiated Power
EL CID—Equipment Location-Certification Information Database
EMC—Electromagnetic Compatibility
EMCP—Electromagnetic Compatibility Program
EME—Electromagnetic Environment
EMI—Electromagnetic Interference
EMS—Electromagnetic Spectrum

ESG—Equipment Spectrum Guidance
ER—Eastern Range
EUCOM—United States European Command
ETCAS—Enhanced Traffic Alert and Collision Avoidance System
EW—Electronic Warfare
FAA—Federal Aviation Administration
FAS—Frequency Assignment Subcommittee
FCC—Federal Communications Commission
FDO—Foreign Disclosure Office
FLIP—Flight Information Publications
FMS—Foreign Military Sales
FP—Frequency Panel (MC4EB)
FRRS—Frequency Resource Records System
FRS—Family Radio Service
FSS—Fixed Satellite Service
GHz—Gigahertz
GMF—Government Master File
GMRS—General Mobile Radio Service
HF—High Frequency
HN—Host Nation
HNSWD-O—Host Nation Spectrum Worldwide Database Online
HQ—Headquarters
HQ ACC—Headquarters Air Combat Command
HQ AETC—Headquarters Air Education and Training Command
HQ AFMC—Headquarters Air Force Material Command
HQ AFRC—Headquarters Air Force Reserve Command
HQ AFSPC—Headquarters Air Force Space Command
HQ AMC—Headquarters Air Mobility Command
ICAO—International Civil Aviation Organization
IFF—Identification Friend or Foe
ILS—Instrument Landing System
IMT—Information Management Tool

Inmarsat™—International Maritime Satellite
IRAC—Interdepartmental Radio Advisory Committee
ISM—Installation Spectrum Manager
ISR—Inter-Squad Radio
ISS—Inter-Satellite Service
ITU—International Telecommunications Union
J/F-12—MC4EB ESG Permanent Working Group process
JFMO—Joint Frequency Management Office
JFP—Joint Frequency Panel
JSC—Joint Spectrum Center
JSIR—Joint Spectrum Interference Resolution
JSUG—JTIDS/MIDS Spectrum Users Guide
JTF—Joint Task Force
kHz—Kilohertz
km—Kilometer
LF—Low Frequency
LMR—Land Mobile Radio
LORAN—Long-Range Aid to Navigation
LOS—Line-of-Sight
LRR—Long-Range Radar
MAG—Military Advisory Group
MAJCOM—Major Command
MARS—Military Affiliate Radio System
MF—Medium Frequency
MHz—Megahertz
MIDS—Multifunctional Information Distribution System
MILACAS—Military Aircraft Collision Avoidance System
XR = Extended-Range
FR = Formation Rendezvous
MILDEP SMO—Military Service Spectrum Management Office
MLS—Microwave Landing System
MM—Maritime Mobile

MMLS—Mobile Microwave Landing System

MOA—Memorandum of Agreement

MOU—Memorandum of Understanding

MSS—Mobile Satellite Services

MURS—Multi-Use Radio Service

NAS—National Airspace System

NASA—National Aeronautics and Space Administration

NATO—North Atlantic Treaty Organization

NAVAID—Navigational Aid

NDB—Non-Directional Beacons

NGB—National Guard Bureau

NIB—Non-Interference Basis

NLT—Not Later Than

nmi—Nautical Mile

NOAA—National Oceanic & Atmospheric Administration

NTH—Note to Holder

NTIA—National Telecommunications and Information Administration

PAR—Precision Approach Radar

POC—Point of Contact

PPS—Pulses Per Second

PRR—Pulse Repetition Rate

PWG—Permanent Working Group

RACES—Radio Amateur Civil Emergency Services

RDS—Records Disposition Schedule

RF—Radio Frequency

RFA—Radio Frequency Authorization

RFI—Radio Frequency Interference

RSEC—Radar Spectrum Engineering Criteria

RX—Receiver

SAF—Secretary of the Air Force

SAR—Search and Rescue

SATURN—Second-Generation Anti-Jam Tactical UHF Radio for NATO

SAV—Staff Assistance Visit
SecAF—Secretary of the Air Force
SCS—Spectrum Certification System
SD—Spectrum-Dependent
SFAF—Standard Frequency Action Format
SGLS—Space-Ground Link Subsystem
SIF—Selective Identification Feature
SINGARS—Single Channel Ground and Airborne Radio System
SIPRNET—Secret Internet Protocol Router Network
SKE—Station Keeping Equipment
SKEFO—Station Keeping Equipment Follow-On
SM—Spectrum Management
SMC—Space and Missile Center
SMO—Spectrum Management Office
SPO—Systems Program Office
SPS—Spectrum Planning Subcommittee
SSRA—Spectrum Supportability Risk Assessments
SSV—Standard Service Volume
STA—Special Temporary Authorization
TACAN—Tactical Air Navigation
TACC—Tanker Airlift Control Center
TADIL—Tactical Digital Information Link
TAG—The Adjutant General
TCAS—Traffic Alert and Collision Avoidance System
TLMR—Trunked Land Mobile Radio
UAS—Unmanned Aerial System
UHF—Ultra High Frequency
US—United States
USAF—United States Air Force
USB—Unified S-Band
USC—United States Code
USCENTCOM—United States Central Command

USD [AT&L]—Under Secretary of Defense for Acquisition, Technology, and Logistics

USMC4EB—United States Military Command, Control, Communications, and Computers-Executive Board

US&P—United States and its Possessions

USPACOM—United States Pacific Command

VHF—Very High Frequency

VOR—VHF Omnidirectional Range

VORTAC—VOR Tactical Air Navigation

WR—Western Range

XP—Programs Office

Terms

NOTE —The following definitions of frequency management terms were extracted from international, national, and DoD regulations and directives. Where appropriate, the source is given in parentheses following each definition: **(RR)**—International Telecommunications Union Radio Regulations; **(NTIA)**—National Telecommunications and Information Administration Manual of Regulations and Procedures for Federal Radio Frequency Management.

Allocation (of a frequency band)—Entry in the Table of Frequency Allocations of a given frequency band for its use by one or more (terrestrial or space) radio communication services or the radio astronomy service under specified conditions. This term also applies to the frequency band concerned (RR).

Allotment (of a radio frequency or radio frequency channel)—Entry of a designated frequency channel in an agreed plan, adopted by a component conference, for use by one or more administrations for a (terrestrial or space) radiocommunication service in one or more identified countries or geographical areas and under specified conditions (RR).

Assigned Frequency—The center of the frequency band assigned to a station (NTIA).

Assignment (of a radio frequency or radio frequency channel)—Authorization given by an administration for a radio station to use a RF or radio frequency channel under specified conditions (RR).

Broadcasting Service—A radiocommunication service in which the transmissions are intended for direct reception by the general public. This service may include sound, television, or other types of transmissions (RR).

Channeling Plan—The plan by which the frequencies within a frequency band are to be assigned.

Characteristic Frequency—A frequency easily identified and measured in a given emission. A carrier frequency may, for example, be designated as the characteristic frequency (RR). (See also Reference Frequency).

Commercial-off-the-Shelf (COTS)—C-E equipment that can be procured by the general public wholesale or retail.

Communications-Electronics (C-E)—The specialized field concerned with the use of electronic devices and systems for the acquisition or acceptance, processing, storage, display, analysis, protection, disposition, and transfer of information.

Coordination Distance—Distance on a given azimuth from an Earth station beyond which a terrestrial station, sharing the same frequency band, neither causes nor is subject to interference emissions greater than a permissible level (RR).

Data Item—A SFAF data item is made up of a data item number, a data item security classification indicator (if required), and the data entry.

Data Item Number—The number (also referred to as a data item identifier) used to identify each data item in a SFAF frequency assignment transaction. It consists of a unique 3-digit number followed by a period and a space. For example, 005 is used to identify the record's security classification.

Earth Station—A station located either on the Earth's surface or within the major portion of the Earth's atmosphere and intended for communication with one or more space stations, or with one or more stations of the same kind by means of one or more reflecting satellites or other objects in space (RR).

Electromagnetic Compatibility (EMC)—(1) The condition that prevails when telecommunications equipment is performing its individually designed function in a common EM without causing or suffering unacceptable degradation due to unintentional EMI to or from other equipment in the same environment (NTIA). (2) DoD: The ability of systems, equipment, and devices that use the EMS to operate in their intended environments without causing or suffering unacceptable or unintentional degradation because of EM radiation or response. (Joint Publication [JP] 1-02).

Electromagnetic Interference (EMI)—Any EM disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics or electrical equipment. It can be induced intentionally, as in some forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and the like.

Electromagnetic Spectrum (EMS)—The range of frequencies of EM radiation from zero to infinity. It is divided into 26 alphabetically designated bands (JP 1-02).

Electronic Warfare (EW)—Military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. EW consists of three divisions: electronic attack, electronic protection, and electronic warfare support. (JP 1-02)

Foreign Disclosure—The approval to release technical information from the DD Form 1494.

Frequency Allocation—See Allocation (of a frequency band).

Frequency Assignment—See Assignment (of a radio frequency or radio frequency channel).

Frequency Assignment, Group—A frequency assignment made only to terrestrial stations and provides authority to operate but does not represent continuing operations, or provide an assignment for planning purposes (9.6.5.) (NTIA).

Frequency Assignment, Regular—An assignment made for an unspecified period of time, subject to the provisions of the NTIA Manual Section 8.2.6. (NTIA 9.6.1.).

Frequency Assignment, Temporary—A frequency assignment for a specified period of time, not to exceed five years. Temporary assignments will have a SFAF Item 141 (expiration date), but may be renewed for additional periods, if necessary. Coordinate this type of assignment at the national level and submit to the FAS for approval and recommendation to the NTIA for assignment. The assignment is entered into the GMF with an appropriate expiration date. Air Force users may apply for a STA for up to 30 calendar days. This type of authorization is not entered into the GMF. Limit STAs to urgent requirements.

Frequency Coordination—The process of obtaining approval to use the RF spectrum via arrangements and technical liaison for the purpose of minimizing harmful interference through cooperative use of the RF spectrum. To be effective, the coordination must extend through the planning, proposal, and actual in use phases of radio frequency utilization.

Frequency Tolerance—The maximum permissible departure by the center frequency of the frequency band occupied by an emission from the assigned frequency, or by the characteristic frequency of an emission from the reference frequency expressed in parts per million or Hz (RR).

Harmful Interference—Interference that endangers the functioning of a radio navigation service or of other safety services, or seriously degrades, obstructs, or repeatedly interrupts a radio communications service operating in accordance with the ITU Radio Regulations (RR).

Hertz (Hz)—A unit of frequency equal to one cycle per second (NTIA).

Identification Friend or Foe (IFF)—A system using electromagnetic transmissions to which equipment carried by friendly forces automatically responds, for example, by emitting pulses, thereby distinguishing themselves from enemy forces.

Industrial, Scientific, and Medical Applications (of radio frequency energy)—Operation of equipment or appliances designed to generate and use local RF energy for industrial, scientific, medical, domestic, or similar purposes, excluding applications in the field of telecommunications (RR).

Instrument Landing System (ILS)—A system of radio navigation intended to assist aircraft in landing which provides lateral and vertical guidance, which may include indications of distance from the optimum point of landing (JP 1-02). A radionavigation system that provides aircraft with horizontal and vertical guidance just before and during landing and, at certain fixed points, indicates the distance to the reference point of landing (RR).

Interference—The effect of unwanted energy due to one or a combination of emissions, radiations, or inductions upon reception in a radio communication system, manifested by any performance degradation, misinterpretation, or loss of information that could be extracted in the absence of such unwanted energy (RR).

Ionospheric Sounder—A device that transmits signals for the purpose of determining ionospheric conditions (NTIA).

Land Station—A station in the mobile service not intended to be used while in motion (RR).

Low Power—Devices that operate according to the specifications listed in the NTIA Manual, Annex K.

Maritime Mobile Service—A mobile service between coast stations and ship stations, or between ship stations, or between associated on-board communication stations; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service (RR).

Marker Beacon—A transmitter in the aeronautical radionavigation service that vertically radiates a distinctive pattern to provide position information to aircraft (RR).

Mean Power (of a radio transmitter)—The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions (RR).

Microwave Landing System (MLS)—A radionavigation system that provides the same information as an ILS but operates in the 5000-5250 MHz band.

Mobile Service—A radiocommunication service between mobile and land stations, or between mobile stations (RR).

Mobile Station—A station in the mobile service intended to be used while in motion or during halts at unspecified points (RR).

Necessary Bandwidth—For a given class of emission, the width of the frequency band, which is minimally sufficient to ensure the transmission of information at the rate, and with the quality, required under specified conditions (RR).

Peak Envelope Power (PEP) (of a radio transmitter)—The average power supplied to the antenna transmission line by a transmitter during one RF cycle at the crest of the modulation envelope taken under normal operating conditions (RR).

Radio Astronomy—Astronomy based on the reception of radio waves of cosmic origin (RR).

Radio Frequency Spectrum—The RF spectrum includes the frequencies from 3.0 kHz to 400 GHz. The presently allocated spectrum is from 9 kHz to 300 GHz.

Radiolocation—Radiodetermination used for purposes other than those of radionavigation (RR).

Radiosonde—An automatic radio transmitter in the meteorological aids service usually carried on an aircraft, free balloon, kite, or parachute, and which transmits meteorological data. (NTIA).

Range Commander—In this instruction, the commander of an AF test or tactical range.

Reference Frequency—A frequency having a fixed and specific position with respect to the assigned frequency. The displacement of this frequency with respect to the assigned frequency has the same absolute value and sign that the displacement of the characteristic frequency has with respect to the center of the frequency band occupied by the emission (RR). (See also Characteristic Frequency.)

Shared-Use Facilities—Any site or installation that has more than one DoD department, agency, or unit. The facilities frequency concerns should be filtered through the “host” agency.

Space Station—A station located on an object, which is beyond, is intended to go beyond, or has been beyond, the major portion of the earth's atmosphere (RR).

Spurious Emission—Emission on a frequency or frequencies that are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions (RR).

Standard Frequency and Time Signal Service—A radio communication service for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception (RR).

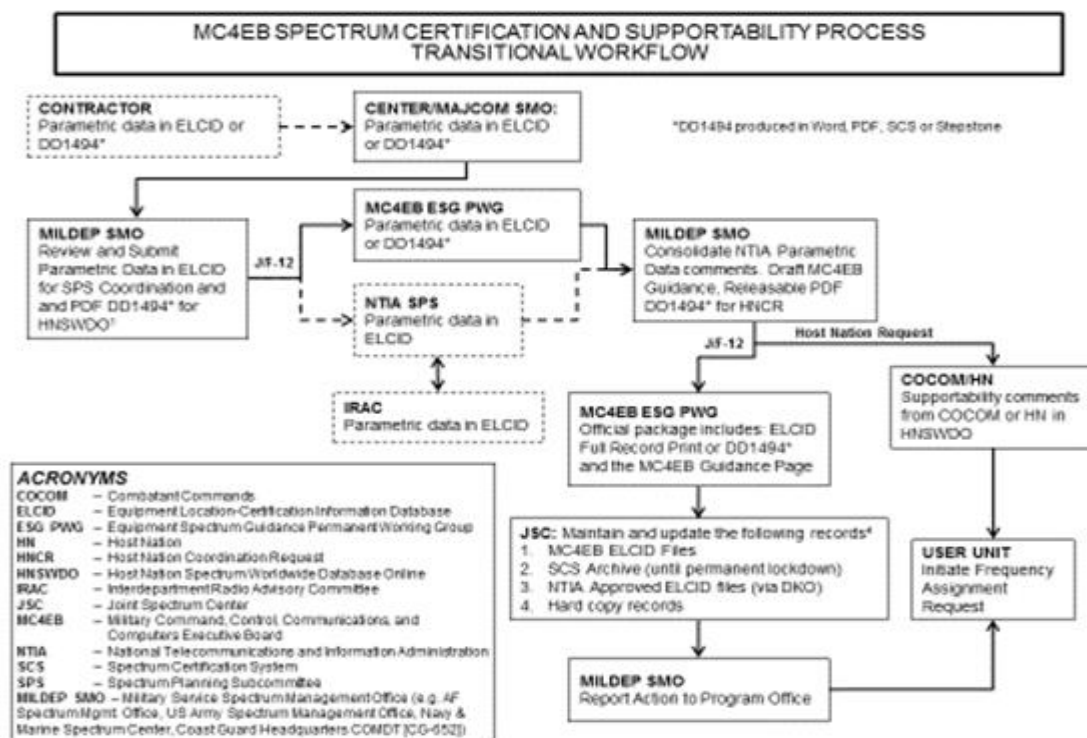
Telecommunication—Any transmission, emission, or reception of signs, signals, writings, images, and sounds or information of any nature by wire, radio, visual or other EM systems (RR).

Telemetry—The use of telecommunication for automatically indicating or recording measurements at a distance from the measuring instrument (RR).

United States and its Possessions (US&P)—Includes the 50 States, District of Columbia, the Commonwealth of Puerto Rico, and the Territories and Possessions (but less the Canal Zone).

AIR FORCE SPECTRUM CERTIFICATION

Figure A2.1. MC4EB Spectrum Certification and Supportability Process Transitional Work Flow.



A2.2. Application for Spectrum Allocation . Using activities, SD system developers, PMOs, and/or acquisition activities must generate and submit either a DD Form 1494, *Application for Equipment Frequency Allocation* (<http://www.dtic.mil/whs/directives/forms/eforms/dd1494.pdf>); shown in Figure A2.1, or an EL CID file to their local systems or logistics center, installation, or facility SMO for further processing in support of the development, modification, or acquisition of SD systems and/or RF devices; including COTS, government-off-the-shelf, or non-developmental items.

Figure A2.2. DD Form 1494.

View Pages 1 To 6 OMB No. 0704-0188

| | | | |
|---|-----------------------|--|---------------------------------------|
| APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION | CLASSIFICATION | DATE | J/F 12 No. |
| | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| | | | Page No. |
| The public reporting burden for this collection of information is estimated to average 24 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Services Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. RETURN COMPLETED FORM TO THE USING AGENCY OR CONTRACTING AGENCY, AS APPROPRIATE. | | | |
| DOD GENERAL INFORMATION | | | |
| TO | | FROM | |
| | | | |
| 1. APPLICATION TITLE | | | |
| | | | |
| 2. SYSTEM NOMENCLATURE | | | |
| | | | |
| 3. STAGE OF ALLOCATION (X one) | | | |
| <input type="checkbox"/> a. STAGE 1 - CONCEPTUAL <input type="checkbox"/> b. STAGE 2 - EXPERIMENTAL <input type="checkbox"/> c. STAGE 3 - DEVELOPMENTAL <input type="checkbox"/> d. STAGE 4 - OPERATIONAL | | | |
| 4. FREQUENCY REQUIREMENTS | | | |
| | | | Add Another Frequency |
| a. FREQUENCY(IES): | | | |
| b. EMISSION DESIGNATOR(S): | | | |
| 5. TARGET STARTING DATE FOR SUBSEQUENT STAGES | | | |
| a. STAGE 2: | | c. STAGE 4: | |
| | | | |
| 6. EXTENT OF USE | | | |
| | | | |
| 7. GEOGRAPHICAL AREA FOR | | | |
| a. STAGE 2: | | | |
| | | | |
| b. STAGE 3: | | | |
| | | | |
| c. STAGE 4: | | | |
| | | | |
| 8. NUMBER OF UNITS | | | |
| a. STAGE 2 | | c. STAGE 4 | |
| | | | |
| 9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT | | | |
| | | | |
| 10. OTHER J/F 12 APPLICATION NUMBER(S) TO BE | | 11. IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11? | |
| a. SUPERSEDED J/F 12/ | | <input type="checkbox"/> a. YES <input type="checkbox"/> b. NO <input type="checkbox"/> c. N/Avail | |
| b. RELATED J/F 12/ | | | |
| | | | |
| 12. NAMES AND TELEPHONE NUMBERS | | | |
| a. PROGRAM MANAGER | | (1) COMMERCIAL PHONE | (2) DSN |
| | | | |
| b. PROJECT ENGINEER | | (1) COMMERCIAL PHONE | (2) DSN |
| | | | |
| 13. REMARKS | | | |
| | | | |
| DOWNGRADING INSTRUCTIONS | | CLASSIFICATION | J/F 12 No. |
| | | <input type="text"/> | <input type="text"/> |
| | | <input type="button" value="Reset Page"/> | |

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A2.2.1. Technical performance EMS parametric data for the application can be obtained from the originator through any available sources, i.e., contractor, manufacturer, etc. The local SMO will submit a complete and accurate application to their applicable MAJCOM SMO for command review and tracking. The MAJCOM SMO will then send the completed application directly to AFSMO via email to the AFSMO/SQC Workflow Box. Using activities, SD system developers, PMOs, and/or acquisition activities without local or MAJCOM SMOs may submit applications directly to AFSMO via email to AFSMO/SQC Workflow Box.

A2.2.1.1. Applications for Spectrum Allocation are processed in stages that align with the Defense Acquisition System Phase or event; i.e. Milestones, in four stages. The using activity, SD system developer, PMO, and/or responsible acquisition activity submits the DD Form 1494 and EL CID file for the appropriate stage as it proceeds along each milestone event or reaches an operational status. These four stages are:

A2.2.1.1.1. **Stage 1.** Conceptual: Initial system planning has been completed. This stage advises on the feasibility of getting spectrum support and recommends modifications or changes in frequency bands.

A2.2.1.2. **Stage 2.** Experimental: Preliminary system design has been completed. Certification at this stage provides guidance for assuring spectrum support in later stages, and is needed before obtaining frequency assignments for experimental testing.

A2.2.1.3. **Stage 3.** Developmental: Major system design has been completed. As the system design is nearly finalized, this stage provides guidelines for assuring spectrum support needed before obtaining frequency assignments for developmental testing.

A2.2.1.4. **Stage 4.** Operational: System development is complete. Certifies availability of spectrum support and identifies operating restrictions before making operational frequency assignments.

A2.2.2. **Lead Times.** Submit DD Form 1494 and EL CID application(s) and ITU registration (space systems) for each stage of development using the lead times found in Table A2.1.

Table A2.1. Application Lead Times.

| | Space Systems | Other Systems |
|---|--|---|
| Stage 1 (Conceptual) | Not Later than (NLT) 6.5 years prior to satellite launch. Optional for submitting Advance Publication Information (API) to ITU | Not less than one year before initial testing begins. |
| Stage 2 (Experimental) | NLT 5.5 years prior to satellite launch; Submit API or Coordination Request (C/R)* to ITU | Not less than one year before procuring equipment. |
| Stage 3 (Developmental) | NLT 3.5 years prior to satellite launch. Submit C/R*, if have not done at Stage 2, to ITU | Not less than one year prior to the Milestone B Decision or contractual obligations for development, or modification activities involving wireless RF devices. |
| | Space Systems | Other Systems |
| Stage 4 (Operational) | NLT 1.5 years prior to launch; Submit Notification** and Date of Bringing Into Use (DBIU)** to ITU | Not less than nine months prior to the Milestone C Decision or contractual obligations for operational procurement or acquisition activities involving wireless RF devices. |
| <p>*C/R may be submitted as early as 6 months but NLT 2 years from API date of receipt by the ITU.</p> <p>**Submit Notification and DBIU Not Earlier Than (NET) 6 or more months after launch but NLT 7 years from API date of receipt by the BR. Submissions of Notification and DBIU should not be tied to an actual launch but should be submitted after the satellite has been successfully launched.</p> | | |

A2.2.3. Note-to-Holder (NTH). NTH is the process used to amend and/or update an approved DD Form 1494 file and MC4EB memoranda. Send requests for NTH through established SMO channels to the AFSMO/SQC Workflow Box.

A2.2.4. Acknowledgment of MC4EB Guidance . Using activities, SD system developers, PMOs, and/or acquisition activities must acknowledge receipt of MC4EB guidance within 60 duty or business days of receipt and notify the supporting MAJCOM of any concerns. Silence is concurrence.

A2.2.5. Classification. Applications for Spectrum Allocation that contain classified information will be marked and handled IAW AFI 16-1404, *Air Force Information Security Program*. Top Secret, SCI, or SAP requests, contact AFSMO directly.

A2.2.6. Additional Guidance for use Outside the US&P.

A2.2.6.1. Foreign Disclosure. Obtain foreign disclosure approval in advance of coordinating HN spectrum support for AF systems designed or planned to operate outside

the US&P. The field-level foreign disclosure office (FDO), the MAJCOM FDO, or the SAF/IA FDO provides disclosure guidelines according to AFI 16-201, Air Force Foreign Disclosure and Technology Transfer Program.

A2.2.6.2. Mark the DD Form 1494 Foreign Coordination page with the appropriate release statement provided by the FDO. Reference AFI 16-201, Section 4.4.2.2 for specific language.

A2.2.6.3. The local SMO ensures that foreign disclosure approval is obtained, including the field-level FDO case number and provides a copy of the approval release with the DD Form 1494 through the chain of command to AFSMO. If field level disclosure approval is not received due to lack of delegated disclosure authority at the field level, notify the MAJCOM SMO.

Attachment 3

EQUIPMENT EXEMPT FROM U.S. SPECTRUM CERTIFICATION

A3.1. Equipment Exempt from Spectrum Certification. According to the NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management; “The NTIA Manual”, the following categories of equipment in the US&P are exempt from the spectrum certification process. If any devices listed below are to be used outside US&P, spectrum certification may be required by the HNs prior to procurement.

A3.1.1. 47 CFR Part 15, *Radio Frequency Devices*. There are provisions in Sections 7.8 and 7.9 and Annex K of the NTIA Manual that allow federal agencies to operate systems that conform to the FCC’s rules in 47 CFR Part 15 (which are incorporated into Annex K of the NTIA Manual) on a non-licensed, non-interference basis.

A3.1.2. 47 CFR Part 18, *Industrial Scientific and Medical Equipment (ISM)*. ISM equipment may be operated under the conditions specified in Section 7.10 of the NTIA Manual without further authorization.

A3.1.3. 47 CFR Part 95, *Personal Radio Services*. IAW Section 7.5.8 of the NTIA Manual, Federal entities are authorized to purchase and operate radios certified by the FCC in the Family Radio Service (FRS), pursuant to 47 CFR Part 95, Subpart B. Federal users will be accorded the same privileges as non-federal users. Because FRS users must share each channel and no user is assured protection from interference caused by another authorized user, Federal entities may not purchase and operate FRS radios for planned communications operations that safeguard human life or property.

A3.1.4. Built-in test equipment that does not exceed the technical criteria outlined in the NTIA manual with the exception of GPS re-radiating equipment.

A3.1.5. Unmodified signal generators intended for use in lab environments.

A3.1.6. Bench test SD equipment inside a laboratory, building, and/or anechoic chamber or to antenna-testing equipment that will not add unwanted radiation to the RF environment.

A3.1.7. Electronic fuses that activate detonation devices.

A3.1.8. Unmodified COTS Family Radio Service (FRS) transceivers.

A3.1.9. Unmodified COTS Citizens’ Band radios and low power radios that operate for short distances on the frequencies 27575 and 27585 kilohertz (kHz).

A3.1.10. Unmodified FCC-licensed low power cordless COTS telephones.

A3.1.11. COTS cellular telephones used to access a commercial service provider. Operation of end user radio devices is under the control of the FCC licensee, and federal use must be IAW FCC rules that govern COTS cellular telephones used to access a commercial service provider. COTS cellular telephones used to access a commercial service providing the specified service. This does not apply when agencies planning to procure for transportable Advanced Wireless Service, Cellular, and Personal Communications Services systems at specific bands IAW para 10.2.7 of the NTIA manual.

A3.1.12. International Maritime Satellite (Inmarsat™) terminals.

A3.1.13. Airborne Radio Telephone System radios that operate on leased channels in the 800 megahertz (MHz) band.

A3.1.14. Infrared and ultraviolet systems used, among other things, to measure heat intensity and spectral signatures of various targets.

A3.1.15. Lasers and other systems that operate above 3000 gigahertz (GHz).

A3.1.16. Global Positioning System receivers universally marketed for civil, industrial, private, and/or military applications.

A3.1.17. Radio receivers used for reception of radio navigation signals from licensed ground stations, such as Distance Measuring Equipment (DME), VOR, ILS, etc.

A3.1.18. Requirements for systems submitted directly to AFSMO for processing that are not owned by an agency of the military service (e.g., radio, radar, and telemetry sets), but are owned by or leased from a contractor or provider, and those networks owned or leased by the contractor or provider to meet any corporate requirements.

Attachment 4

HOST NATION COORDINATION PROCESS

A4.1. All SD equipment that will be used by deploying or garrisoned forces in another nation must be approved by the HN through the HN coordination process. While the process for gaining authorization to use SD equipment in other nations is separate and distinct from the US process, the DD Form 1494 is used to initiate the HN coordination request (HNCR).

A4.2. To ensure timely program implementation, HN coordination should begin with sufficient lead time to allow for completion of the coordination process prior to operational deadlines.

A4.3. Contents of the HNCR Package. A submission package that is separate from the US package must be prepared. The first step is to determine the locations where the equipment will likely operate. Each nation is aligned under a CCMD AOR IAW the Unified Command Plan. The CCMDs have unique processes and some require more detailed information than others. However, any HN coordination package requires a Foreign Disclosure Letter be submitted to AFSMO.

A4.4. Foreign Disclosure Letter. Determine the locations where the equipment will be used. If this determination is uncertain, use the best approximation available. The data on a DD Form 1494 must be deemed releasable to these nations. To begin the process, the completed DD Form 1494 should be reviewed by the appropriate AF Foreign Disclosure Office (FDO). The appropriate MAJCOM FDO will determine whether the information contained on the DD Form 1494 is releasable. If the FDO cannot make the decision, the DD Form 1494 will be forwarded through the disclosure channels to SAF/IA. Once foreign disclosure is granted, the submitter of the DD Form 1494 must provide a letter indicating the release approval including the case number to their local SMO with the foreign coordination DD Form 1494 package. The releasable data must accompany the appropriate foreign disclosure release letter. The foreign disclosure release letter indicates the nations that can receive the different data. Alternatively, the FDO may specify that the DD Form 1494 may not be released to a HN for spectrum supportability coordination, but that individual data items may be released to that nation for the purpose of coordinating frequency assignments for operations within the country.

A4.5. HN Coordination Package. MAJCOMs/Centers will submit HNCR to AFSMO. Upon receipt, AFSMO will review the HNCR. Once the United States Air Force (USAF) HN coordinator at AFSMO has approved, the request will be uploaded to HN Spectrum Worldwide Database Online (HNSWDO) for further review by the MC4EB ESG Steering Member. Once the ESG Steering Member has approved release of the request to CCMD for HN coordination, AFSMO will upload the MC4EB cover letter for the request to HNSWD-O. AFSMO will then release the request to CCMD for coordination of the request with HNs as specified. This coordination ends with HN comments being received by CCMD and entered into HNSWD-O for review by AFSMO. With the DoD acceptance of HNSWD-O as the official HN coordination database, HN comments no longer are included in NTH requests for appendage of such comments to MC4EB memos. Instead, these comments can be approved directly by AFSMO in HNSWD-O, as AFSMO is authorized to accept HN comments on behalf of the USAF. HNSWDO serves as the repository for all HN comments received by CCMDs.

A4.6. Unique HN Coordination. Some countries may have unique HN processes, for example Japan and Korea. These countries do not allow equipment to be coordinated for possible future

deployments. Coordination for notional equipment use is not permitted. As a result, HN coordination with Japan and Korea has an associated timeline of 90 duty days after HN comments are received to submit a frequency proposal. If no frequency proposal is submitted in that time frame then the HN coordination will have to be reinitiated.

A4.7. Submission Procedures. As in the DD Form 1494 process, the submitter's spectrum manager will distribute the completed HNCR package to the spectrum manager in the next level of the chain of command. AFSMO will provide the HNCR package to the MC4EB for tasking to the appropriate CCMD, or to the Defense Attaché Office for foreign coordination.

Attachment 5

SPECTRUM SUPPORTABILITY RISK ASSESSMENT PROCESS

A5.1. General. The SSRA is the principal means by which the DoD determines whether sufficient spectrum is available for the SD equipment associated with a proposed system/platform. This attachment describes the Air Force Spectrum Supportability Risk Assessment (AF SSRA) process, applies to all AF SD system acquisitions, and is intended to be used in conjunction with the guidance and suggested tasks provided in DoD Instruction (DoDI) 4650.01, Policy and Procedures for Management and Use of the Electromagnetic Spectrum.

A5.1.1. This instruction applies to all Air Force SD program managers (PMs), materiel developers, program executives, and program offices (POs). In addition, the roles of the SSRA author and the PM include developing relationships with the appropriate MAJCOM spectrum management office (SMO) and AFSMO to familiarize personnel in these offices with the nature of the particular SSRA and to facilitate the collection and exchange of information during the preparation of the SSRA. All AF SD systems are required to complete SSRA submissions for each Milestone decision. The content of the SSRA to be completed differs between developmental and non-developmental programs. To support the delivery and completion of SSRAs a set of clear coherent directions are provided to assist SSRA authors.

A5.1.2. SSRAs should be created in an electronic format, preferably using the Microsoft Office suite. The electronic version of the SSRA should be used throughout coordination, review, and submission. Use of the portable document file (pdf) format should be avoided. Prior to the presentation of the completed SSRA to the milestone decision authority (MDA), the PM will approve and forward the SSRA to the MAJCOM-A6, who after their review and concurrence actions will forward the package to the AF/SSRA review authority at AFSMO who will complete their review and concurrence actions and submit the package to the Director of AFSMO. After receiving AFSMO/CC concurrence with appropriate signatures the package will be submitted to the AF/CIO for their completion of the review actions. The PM is expected to maintain a file version control scheme that will ensure changes to the SSRA are properly recorded during the preparation and coordination of the document.

A5.2. AF SSRA. The SSRA is needed to ensure the Air Force procurement system uses due diligence to provide reasonable assurance its SD equipment will be able to obtain access to sufficient radio frequency spectrum in the electromagnetic environment required while using that spectrum efficiently. The Air Force owns, manages, and develops SD equipment and capabilities and must plan for future SD equipment configurations. Given the limited frequency spectrum available for DoD SD equipment, it is vital that the Air Force is cognizant of all existing and planned system/platform SD equipment. SD equipment is currently regulated and certified in the US&P through the National Telecommunications and Information Agency (NTIA) review and certification process. International DoD SD equipment usage is managed through Host Nation Coordination (HNC) and International Telecommunications Union (ITU) conferences, agreements, and treaties.

A5.2.1. DoDI 4650.01 and the *“Joint Service Guide for the Production of a Spectrum Supportability Risk Assessment (SSRA)”* are the principal sources for SSRA requirements and procedures. The SSRA is a very important DoD and Air Force spectrum management tool

that helps identify spectrum issues that affect the DoD and Air Forces' ability to field system(s)/platform(s) that meets SD equipment design requirements. Once all spectrum issues have been identified, an assessment of the spectrum supportability risk associated with the system/platform including any proposed mitigations is provided. For major SD systems, SSRAs are required at key MS decision points, as described in para A5.4, as the system makes its way through the acquisition review lifecycle. However, all SD developers should identify and mitigate regulatory, technical, and operational spectrum supportability risks using suggested tasks in this attachment. The SSRA document title typically includes the MS for which the SSRA is submitted.

A5.2.2. An SSRA is composed of four components and an executive summary. The four are the Regulatory, Technical, Electromagnetic Environment Effects (E3), and Operational components. These components are combined as needed to form a single risk assessment for the applicable system or platform to meet the successive MS review requirements. The Executive Summary provides a synopsis of the overall assessment for the system/platform SD equipment at that MS point in the acquisition review cycle. The linking of the SSRA requirement with the program MS approval process ensures that spectrum availability issues are addressed throughout the program lifecycle.

A5.2.2.1. The Regulatory component addresses the equipment spectrum certification (ESC) stage and status and the relative status of the acquisition with respect to the radio services authorized within the Tables of Frequency Allocations (TOAs) of the U.S. and intended HNs. The Regulatory component of the SSRA for a space station should also identify ITU registrations for other space stations registered in the frequency band being sought for operation. As the system matures, the Regulatory component should contain additional spectrum insights from the ESC and HNC processes. Assess whether frequency management regulations are complied with and spectrum is available for operations in the host nation.

A5.2.2.2. The combined Technical/E3 component. The Technical component focuses on candidate technologies and available technical parameters, such as system type, platform type, bandwidth requirements, etc, to generate initial quantification of potential mutual interactions. DoD Components developing or acquiring SD systems, including CI and NDI, are required to perform limited E3 assessments as part of the SSRA; as a minimum, EMC and EMI are to be addressed to determine the potential for interactions between the proposed system and its anticipated operational EME. The assessment also includes an analysis to determine the possible effect on operational performance as a result of any EM interaction. Analyses of additional E3 disciplines (e.g. HERP, HERF, HERO, EMP, lightning, ESD, etc) may be required; contact the MILDEP SMO for guidance. The combined Technical/E3 component assesses the ability of the platform or system to operate without intersystem and intrasystem interference.

A5.2.2.3. The Operational component assesses the full complement of SD systems anticipated to be in the operational environment. As data or hardware becomes available, analyses should be performed and/or updated to determine if the system meets its operational performance requirements as specified in the Joint Urgent Operational Need Statement (JUONS) or Operational Need Statement (ONS), or the acquisition documents (e.g. ICD, CDD, CPD, or ISP). F-D separations and mitigation measures and/or TTPs that may be needed to reduce risks to acceptable levels should also be identified.

A5.3. Preparing the SSRA. SD system developers, PMOs, and/or acquisition activities will generate and submit an SSRA report before each acquisition milestone using the outline presented in Table A2.1 and tasks provided in DoDI 4650.01, Enclosure 3; Table 2.

Table A5.1. SSRA Report.

| Report Outline | |
|--|--|
| REPORT ITEM | DESCRIPTION |
| COVER PAGE | Include submitter, PMO and/or PEO signature blocks |
| SIGNATURE PAGE | Contains digital signature blocks indicating concurrence from: PM, MAJCOM A6 Representative, AFSMO/SQ, AFSMO/CC, and SAF CIO |
| EXECUTIVE SUMMARY | Short synopsis of the totality of the SSRA |
| SYSTEM PURPOSE | Why, who will it support? |
| SYSTEM DESCRIPTION | Context of system acquisition |
| PROGRAM BACKGROUND | What is it? |
| CONCEPT OF OPERATIONS | How will it be used? |
| AREA OF OPERATIONS | Where will it be used? |
| SPECTRUM USE | Addresses how the program is working to achieve spectrum efficiency, flexibility, interoperability, and other considerations |
| SPECTRUM SUPPORTABILITY ASSESSMENT SUMMARY | Main body of the report establishing the basis and rationale for the recommendations |
| APPENDIX A | |
| 1. Regulatory Component | Details of actions taken to address Spectrum Access/Use Risks |
| APPENDIX B | |
| 1. Technical Component | Details of actions taken to address EMS performance, characteristic, & parametric data |
| APPENDIX C | |
| 1. Operational Component | Details of actions taken to address vulnerabilities/limitations; i.e. interference |
| FIGURES & TABLES | Additional details as appropriate |

A5.3.1. Program Management Office will:

A5.3.1.1. Ensure all required SSRAs are prepared, reviewed, and submitted through the prescribed review process IAW the information contained in this instruction. (T-2)

A5.3.1.2. Ensure that each completed SSRA is submitted to the review process in sufficient time for the various review bodies to complete their actions prior to the milestone decision event.

A5.3.1.3. Not release, obligate, or expend funds for the acquisition, research, development, production, purchase, lease, or use of weapons systems, information management systems, EW systems, electronic countermeasures systems, or other systems that require use of the electromagnetic spectrum until:

A5.3.1.3.1. The SAF CIO/A6 has provided a favorable spectrum supportability determination (SSD) based upon a comprehensive spectrum supportability assessment(s).

A5.3.1.3.2. An equipment spectrum certification submission, Application for Equipment Frequency Allocation, has been approved.

A5.3.1.4. Consider the SSRA development cost in budget justification during the procurement phase of major telecommunication, broadcast, radar, and similar systems.

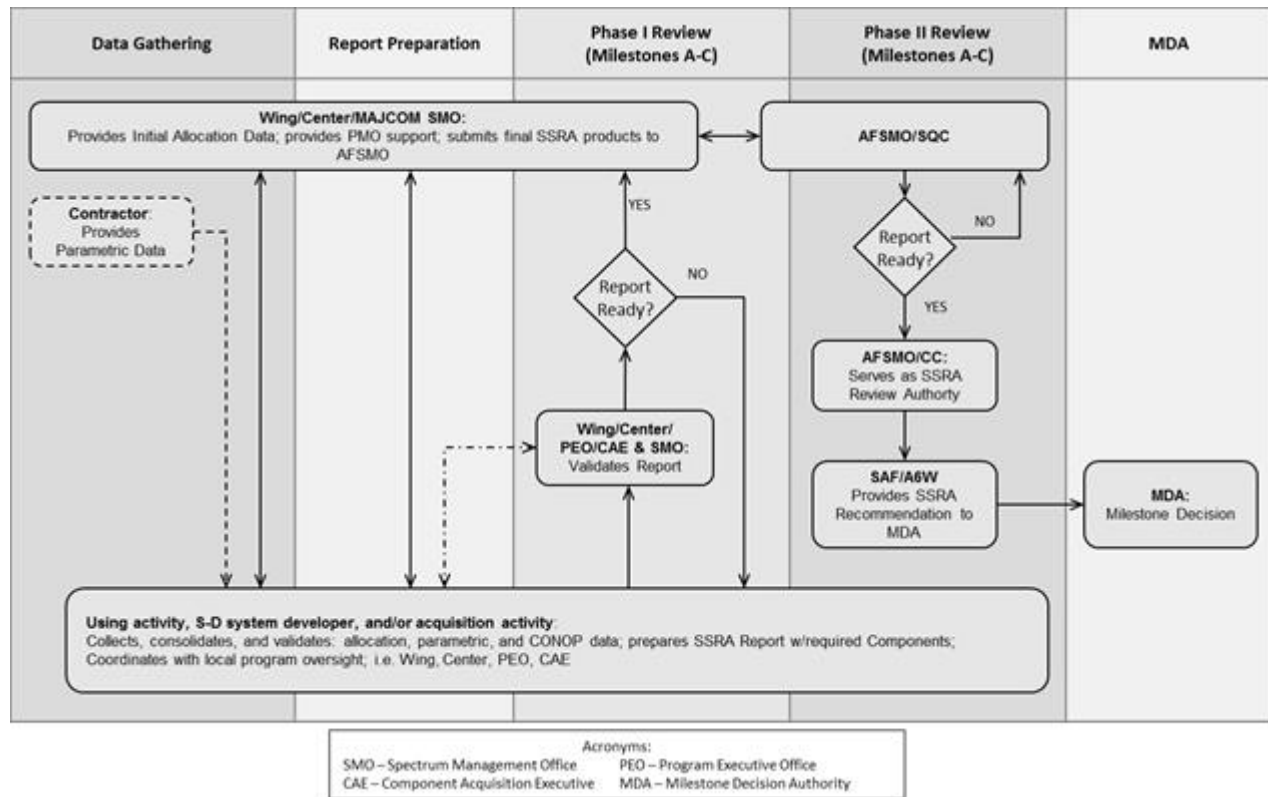
A5.4. Milestones and submission timelines. The information below summarizes by milestone the key SSRA components, their contents, and timelines. The submission and review process follows the two-phased order shown in Figure A5.1 below.

A5.4.1. As the program progresses through its lifecycle Milestone (MS) events the following requirements must be met.

A5.4.1.1. At MS A, the initial Regulatory component of the SSRA should be completed and should include a listing of the equipment certification status of the system/platform SD equipment. At MS A, Technical and E3 issues of concern to the PO should be addressed (such as SD equipment proposed for operation in frequency bands not allocated for the radio service of the SD equipment). An initial description of the system/platform operational environment should also be presented at MS A.

A5.4.1.2. At MS B greater detail should be provided for the Regulatory, Technical & E3, and Operational components of the SSRA. HNC status, radio frequency characteristics, and concept of operations information should all be in the MS B SSRA.

Figure A5.1. SSRA Workflow.



A5.4.1.3. At MS C, full assessments of spectrum supportability risks should be completed for the Regulatory, Technical & E3, and Operational components. The MS C spectrum supportability risk assessments need to be fully completed for each component in order that the MDA can decide whether or not to approve low-rate initial production. Consequently, the MS C SSRA should contain an overall Executive Summary spectrum supportability assessment to aid in the MDA MS C decisions.

A5.4.1.4. The full rate production (FRP) Milestone is the means by which the MDA tracks the spectrum supportability of new versions and/or upgrades to the system/platform and its SD equipment. Only those SSRA components affected by the new version and/or upgrade are revised for FRP.

A5.4.2. All SSRAs are to be initiated into the review process from the PM to the appropriate Wing, Center, or MAJCOM Spectrum Management Office not later than ninety days prior to the scheduled Milestone decision. Each of the reviewing organizations must ensure their review is properly completed while remaining cognizant of the time the other reviewers will need to complete the process to ensure the MDA receives the SSRA in time to meet the scheduled Milestone decision. This review process timeline is applicable for all MS SSRAs. (T-2)

A5.5. Reviewing the SSRA. The information below summarizes the review process actions after the PM has submitted the SSRA.

A5.5.1. MAJCOM Spectrum Management Office will:

A5.5.1.1. Review each subordinate unit SSRA submission ensuring each required assessment component has been properly and accurately completed and presented. (T-2)

A5.5.1.2. In the event of any concern which could result in non-concurrence with the SSRA.

A5.5.1.2.1. Conduct the necessary collaboration with the PO to resolve the concern.

A5.5.1.2.2. In the event the concern cannot be resolved, prepare an attachment to the SSRA describing the issue, the efforts made to resolve the concern, and why the concern was not resolved.

A5.5.1.3. Sign the SSRA signature page circling as appropriate concur / non-concur.

A5.5.1.4. Forward the SSRA via email with all attachments to the AFSMO Workflow email (afsmocworkflow@us.af.mil) for action.

A5.5.2. AFSMO will:

A5.5.2.1. Review each SSRA ensuring each required assessment component has been accurately completed and presented. (T-2)

A5.5.2.2. In the event the point of concern which could result in a non-concurrence with the SSRA, conduct the necessary collaboration with the MAJCOM to resolve the concern ensuring the relevant PO is copied in all information exchanges.

A5.5.2.2.1. In the event a point of concern cannot be resolved, AFSMO reviewers will inform the PO and prepare an attachment to the SSRA describing the concern, the efforts made to resolve the concern, and why the concern was not resolved thus resulting in the non-concurrence entry in the signature page.

A5.5.2.2.2. If minor changes are required, the MAJCOM or PO should coordinate the required modifications via a signed addendum to the original SSRA package.

A5.5.2.3. Sign the SSRA providing a recommendation of concur / non-concur. A5.5.2.4. Submit the SSRA package to the Chief, Information Dominance and Chief Information Officer, SAF/ CIO A6 for action.

Attachment 6

FREQUENCY ASSIGNMENT CLASSIFICATION REFERENCE

A6.1. Security Classification. This attachment is a reference used for Air Force specific frequency assignment requirements. As a reference it explains the handling and retention of the classification of frequency assignments, whereas DODM 5200.01 and AFI 16-1404 are general in nature. This attachment is reference only and is not to be used as a classification source.

A6.1.1. Primarily the association with the function they support determines security classification of DoD and Federal Government frequency assignments and the information in them. Classify individual data items according to DODM 5200.01 and AFI 16-1404.

A6.2. Individual Air Force Frequency Assignments.

A6.2.1. The following frequency assignment information, standing alone or in combination and not associated with any other assignment information, is UNCLASSIFIED. Mark these items as (U) in the SFAF.

A6.2.1.1. Overall classification of the frequency assignment (SFAF Item 005).

A6.2.1.2. Security classification modification (SFAF Item 006).

A6.2.1.3. Type of action (SFAF Item 010).

A6.2.1.4. Agency serial number (SFAF Item 102). Note: AFT serial numbers are for STAs only.

A6.2.1.5. IRAC docket number (SFAF Item 103).

A6.2.1.6. List serial number (SFAF Item 105).

A6.2.1.7. Serial replaced, delete date (SFAF Item 106).

A6.2.1.8. Docket number of older authorizations (SFAF Item 108).

A6.2.1.9. Operating frequency or frequency band and excluded frequency or frequency band (SFAF Items 110 and 111).

A6.2.1.10. Agency (SFAF Item 200).

A6.2.1.11. Command (SFAF Item 204).

A6.2.1.12. IRAC Notes (SFAF Item 500).

A6.2.1.13. Frequency action officer (SFAF Item 701).

A6.2.1.14. Control/request number (SFAF Item 702).

A6.2.2. Classify other assignment information, standing alone or in combination with other information (including A2.2.1.), according to DODM 5200.01 and AFI 16-1404 by the appropriate classification authority. Include the appropriate classification marking with the corresponding SFAF Item.

A6.3. Lists of Air Force Frequency Assignments.

A6.3.1. Most individual frequency assignment records in the Radio Frequency Authorization (RFA) are individually unclassified, classify the total RFA according to the highest

classification level of the assignments it contains. Lists (two or more frequencies) of unclassified frequency assignment records in a given range of frequencies, or in a given area, can be categorized as sensitive, but unclassified because they may provide information leading to the disclosure of military or national security-related operations and scientific and technological matters relating to national security. These lists can indicate the overall strategic telecommunications capabilities of the US, and their disclosure could cause damage to national security. The continued protection of this information is essential to national security because it pertains to communications security and reveals vulnerabilities and capabilities. Its unauthorized disclosure can reasonably be expected to result in nullifying the effectiveness of telecommunications networks and the capability of the US.

A6.3.2. The MC4EB-M-001-12, dated 9 Nov 12, gives guidance on classifying compilations of frequency assignment records. Based on this guidance:

A6.3.2.1. Classify RFAs or frequency lists at the highest level of any individual frequency assignment it contains.

A6.3.2.2. When RFAs or frequency lists contain the aggregation of UNCLASSIFIED DoD, MILDEP, or NSA frequency assignment records, classify it CONFIDENTIAL, except as exempted by para A2.5.

A6.3.2.3. An RFA or frequency list containing only UNCLASSIFIED assignments of one unit or location is considered UNCLASSIFIED. For example, to select all records where SFAF data Item 200 (Agency) = USAF would result in a CONFIDENTIAL aggregate list; whereas, select all records where SFAF Item 301 (Transmitter Location) or 401 (Receiver Location) = Hill would result in an UNCLASSIFIED aggregate list. Users that plan to operate in an UNCLASSIFIED environment should select from the FRRS only UNCLASSIFIED records applicable to their operational requirements.

A6.4. Marking.

A6.4.1. All DoD frequency assignment material must contain proper warnings/markings, as outlined, whether computer-generated or manually applied. Mark DoD data extracted from frequency assignment databases with one of the following warning statements, depending upon which category is applicable.

A6.4.2. Documents/Material containing SECRET/CONFIDENTIAL frequency assignment or equipment spectrum certification records and UNCLASSIFIED “sensitive” DoD frequency assignment or equipment spectrum certification records /data will be marked IAW current security directives under Section 4 of the MC4EB-M-001-12 and carry markings according to existing DoD security regulations and AFI 16-1404. For example:

A6.4.2.1. Derived From: DoD Frequency Assignment and Equipment Spectrum Certification Security Classification Guide . Declassify on: 25X5

A6.4.3. The documents/material will have the following warning attached:

A6.4.3.1. **WARNING** - In addition to SECRET or CONFIDENTIAL data, this document contains UNCLASSIFIED “sensitive” frequency assignment or equipment spectrum certification records that are identified with a special handling instruction code of “B” through “Z”. These records /data which must be protected IAW Section 2.2.4. of

the DoD Frequency Assignment and Equipment Spectrum Certification Security Classification Guide

A6.4.3.2. The destruction of UNCLASSIFIED “sensitive” records/data in this document must be by shredding or tearing into pieces and discarding the pieces in regular trash containers.

A6.4.3.3. This document contains records/data that is exempt from release under the provisions of DoDD 5200.1-R, Information Security Program Regulation Appendix 3, para AP3.6.1.1. These records could, if released, cause harm to the national interest of the U.S. and are not releasable outside the U.S. Government except as indicated in the Special Handling Instructions code.” The release (other than as specified by the special handling code) of any records to any non-U.S. Government organization requires approval of the authority (agency) responsible for creating the record. **NOTE:** This document contains records/data that is exempt from release under the provisions of DoDD5200.1-R, Information Security Program Regulation Appendix 3, para AP3.6.1.1. These records could, if released, cause harm to the national interest of the U.S. and are not releasable outside the U.S. Government except as indicated in the Special Handling Instructions code.” The release (other than as specified by the special handling code) of any records to any non-U.S. Government organization requires approval of the authority (agency) responsible for creating the record.

A6.4.4. Mark material containing SECRET or CONFIDENTIAL frequency assignment records and, either UNCLASSIFIED DoD frequency assignment records that meet the aggregation criteria set forth in Section 3 of the MC4EB-M-001-12 or UNCLASSIFIED DoD frequency assignment records/data extracted from the aggregated lists according to current security directives and contain the following warning statement:

A6.4.4.1. WARNING – In addition to SECRET or CONFIDENTIAL data, this document contains UNCLASSIFIED frequency assignment records/data that must be protected according to Section 3 of the DoD Frequency Assignment Security Classification Guide.

A6.4.4.2. Destroy UNCLASSIFIED records/data in this document according to existing directives governing destruction of classified material.

A6.4.4.3. This document contains records/data that are exempt from public release under the provisions of the Title 5 USC 552(b)(1). The release of any records to any non-DoD organization requires approval of the authority (agency) that made the assignment.

A6.4.5. Mark documents/material containing one or more UNCLASSIFIED frequency assignment record/data extracted from aggregated lists that are classified CONFIDENTIAL as set forth in Section 3 of the MC4EB-M-001-12 UNCLASSIFIED and contain the following warning:

A6.4.5.1. WARNING – This document/listing is UNCLASSIFIED; however, it contains frequency assignment records/data that you must protect according to Section 3 of the MC4EB-M-001-12.

A6.4.5.2. Destroy UNCLASSIFIED records/data in this document according to existing directives governing destruction of classified material.

A6.4.5.3. This document contains records/data that are exempt from public release under the provisions of the Title 5 USC 552(b)(1). The release of any records to any non-DoD organization requires approval of the authority (agency) that made the assignment.

A6.5. Exemptions.

A6.5.1. The following types of frequency assignment records are exempt from the classification requirements listed in para A2.3.2.2.

A6.5.1.1. Lists of UNCLASSIFIED frequency assignments to government users that are not intended to be public (i.e., travelers information stations, weather broadcast stations, certain stations in the maritime radio navigation and maritime mobile services, and stations in the international broadcast services).

A6.5.1.2. Lists of aeronautical station frequencies under the purview of the Aeronautical Assignment Group when used in the National Airspace System.

A6.5.1.3. Lists of UNCLASSIFIED frequency assignment records that operate on frequencies authorized to non-government stations, where such use is necessary to intercommunicate with non-government stations for coordination with non-government activities.

A6.5.1.4. Lists of frequencies in NTIA or DoD channel plans when specific location, technical parameters, and organization are not collectively included in the channel plan.

Attachment 7

FREQUENCY ASSIGNMENT REVIEW PROCESS

A7.1. The frequency assignment review process is normally accomplished by reviewing within a given year all frequency assignments that were last reviewed during the previous five to ten years, or SFAF Line 143: Revision Date.

A7.2. Assignment reviews shall be accomplished by the revision date (SFAF 143) plus:

A7.2.1. Five years for most assignments.

A7.2.2. Ten years for those assignments considered by the Aeronautical Assignments Group (AAG).

A7.2.3. Ten years for assignments in which all the space stations are in a geostationary-satellite orbit.

A7.2.4. Five years for assignments which include one or more space stations in a non-geostationary satellite orbit.

A7.3. During the review the unit/organization responsible for the assignment will determine for each frequency assignment:

A7.3.1. Whether the assignment is essential to meet the agency's requirements; and,

A7.3.2. If so, whether other existing assignments will meet the requirements; and,

A7.3.3. If not, whether the justification for and description of the assignment under review, are still accurate; and,

A7.3.4. If so, whether the assignment is completely up to date.

A7.4. Each unit/organization responsible for the assignment will maintain the contact information of the person responsible for validating that the radio frequency is still in use. This information will include their name and date of verification for each 5 year or 10 year review and will be accessible to AFSMO via SXXI.

A7.5. An assignment is completely up to date if it contains in the proper fields all of the particulars required by the NTIA Manual and applicable DoD and AF policy.

A7.6. Responsible spectrum management entities will submit DELETION actions for those assignments that are not qualified for retention under A7.3.1 above. Those assignments qualified for retention, but not up to date IAW the particulars of the NTIA manual and applicable DoD and AF policy, will be updated by submitting a MODIFICATION action using the procedures found in the NTIA Manual, [Chapter 9](#).

A7.7. Assignments qualified for retention, and completely up to date IAW the NTIA Manual, DoD and AF policy, will be certified by the NTIA Frequency Assignment Subcommittee.

Attachment 8**AERONAUTICAL RADIONAVIGATION SPECTRUM MATTERS FOR FAA AND DOD AFCS****A8.1. Aeronautical Radionavigation**

A8.1.1. FAA coordination of AAG and Radar Bands (190-285 kHz, 285-435 kHz, 510-535 kHz, 74.800-75.200 MHz, 108.000-121.9375 MHz, 123.5875-128.8125 MHz, 132.0125-137.000 MHz, 328.6-335.4 MHz, 978-1020 MHz, 1030 MHz, 1031-1087 MHz, 1090 MHz, 1104-1146 MHz, 1157-1213 MHz 5000-5250 MHz) and Air Traffic Control frequencies in the Military Assignment Group (MAG) Bands (225-328.6 and 335.4-399.9 MHz). The coordination of unclassified frequencies will be done through the FAA WebFCR (Frequency Coordination Request) portal located at <https://webfcr.faa.gov>.

A8.1.2. The FAA coordinator provides a coordination serial number that must be entered in Standard Frequency Action Format (SFAF) Item 501 as a M018 note.

A8.1.3. AF installations having an ATC support agreement with a FAA facility for local control of civil aircraft will be assigned suitable VHF frequencies for control of civil aircraft.

A8.1.4. Agencies requiring frequencies in the bands listed in the NTIA Manual, Annex D, will coordinate all actions with HQ FAA frequency coordinators listed in Table 1 of that Annex.

Attachment 9

AIR FORCE - DOD AREA FREQUENCY COORDINATORS FOR NATIONAL AND SERVICE TEST AND TRAINING RANGES

A9.1. This enclosure describes duties and responsibilities of the Air Force DoD AFC for minimizing EMI at, among, and within the line-of-sight of three Air Force test and training ranges and with all civil and non-military federal activities within the AF DoD AFC responsible area of responsibility (AOR). Crucial to the frequency coordination process is developing and maintaining a cadre of highly skilled, qualified and professional frequency coordinator personnel. Adequate resources are required to implement these systems and processes.

A9.2. For the purpose of these terms of reference the following definitions apply:

A9.2.1. Frequency coordination: the process of obtaining approval to use the EMS via arrangements and technical liaison for the purpose of minimizing harmful interference through cooperative use of the EMS. To be effective, the coordination must extend through the planning, proposal, and actual in-use phases of radio frequency utilization.

A9.2.2. Harmful interference: interference which endangers the functioning of a radio navigation service or of other safety services, or seriously degrades, obstructs, or repeatedly interrupts a radio communications service operating IAW the NTIA Manual.

A9.2.3. Line-of-sight (LOS): the distance to the horizon at a given height approximated by the formula: $d = \sqrt{2}h_t + \sqrt{2}h_r$ (distance equals [the square root of two times the height of the transmitter antenna] plus [the square root of two times the height of the receiver antenna]), where d = LOS (miles), h_t = height of the transmitter antenna in feet and h_r = height of the receiver antenna in feet. For purposes of this document, "LOS" includes situations where a non-line-of-sight emitter has the capability, due to propagation and other technical factors, to interfere with a range or range-hosted system.

A9.2.4. Range equipment/systems: range equipment refers to any SD item (e.g., transmitter, receiver) that is part of or organic to the range infrastructure including, range telemetry, radars, data links, installation security, law enforcement, medical telemetry, telecommunications systems, etc.

A9.2.5. Range-hosted equipment/systems: refers to any SD device, whether stand alone or part of another platform, brought to a range for research, development, test, evaluation (RDT&E), training or demonstration.

A9.3. Air Force Major Range and Test Facility Base. The Air Force Major Range and Test Facility Base (MRTFB) is a set of test installations, facilities, and ranges which are regarded as national assets. These assets are sized, operated, and maintained primarily for DoD test and evaluation missions. However, the MRTFB facilities and ranges are also available to other users on a reimbursable basis such as U.S. Government Agencies (Federal, State and local), defense contractors, commercial entities, and allied foreign governments. Because of the wide variety of activities that may take place on the DoD Ranges, often simultaneously, the functions performed by the AFC are critical. Facilities comprising the Air Force MRTFB with AFC oversight are listed below, and as defined in NTIA Manual, Table 8.3.26 and Annex D.

A9.3.1. Eastern AFC. 45th Space Wing, Air Force Space Command (AFSPC) provides support to the Eastern AFC at Patrick AFB FL.

A9.3.2. Gulf AFC. 96th Test Wing, Air Force Materiel Command (HQ AFMC) provides support to the Gulf AFC at Eglin AFB FL.

A9.3.3. Nevada AFC. 99th Air Base Wing provides support to the Nevada AFC at Nellis AFB NV.

A9.4. Procedures. The following responsibilities and procedures apply.

A9.4.1. The MILDEPs are responsible for the coordination and assignment of radio frequencies in support of all military operations in CONUS and for the coordination of military spectrum use among civil and Federal agencies within the US&P.

A9.4.2. The AF DoD AFC is responsible for frequency coordination in the areas that lie in, among and within line-of-sight of AF range or range-hosted SD system at a major AF test and training range, or other designated complexes. Although AF DoD AFCs are assigned by the MILDEPs, these coordinators are responsible to OSD/CIO, and thus, are responsible for complying with all provisions of this publication and all spectrum-related national, departmental, joint and DoD spectrum-related regulations, instructions, manuals and policies. AF DoD AFCs will communicate through proper MILDEP channels to establish a departmental position prior to presenting an issue or subject to the OSD/CIO, MC4EB FP, or national level. AF DoD AFCs and installation/range spectrum managers are responsible for the compliance of spectrum-dependent systems within their purview with national, joint, DoD and departmental procedures. Range Commanders shall resource AFCs assigned by the MILDEPs at the range location where the AFC resides.

A9.4.3. AF DoD AFCs will ensure their range and range-hosted SD systems comply with all spectrum-related national, joint, DoD, and department regulations, instructions, manuals and policies. AF DoD AFCs are also responsible for the operational de-confliction of all SD assets under their purview with other spectrum users through established frequency de-confliction processes. The AF DoD AFC will inform the Range or Center Commander and the ISM at which they reside and to the Commanders and the respective ISM's at other installations within the AOR of that AFC for all spectrum actions as noted above.

A9.5. The MILDEPs will ensure coordination has been accomplished with the appropriate DoD AFC and cognizant base/ISM prior to assignment of all frequencies, or activation of any intended EMS use, within, among or within line-of-sight of the areas delineated in para 9.4 above. Spectrum use may not be authorized until permission is granted by the cognizant AF DoD AFC in coordination, as necessary, with all other AF DoD AFCs – and ISM - that could be affected by any MILDEP activity. Coordination for ships and aircraft use at non-US instrumentation sites and within international waters, will be accomplished by the cognizant MILDEP with the appropriate CCMDs through the MC4EB FP. AF DoD AFCs will function within the following terms of reference and procedures. Nothing in these terms of reference is intended to usurp the services and/or a commander's responsibilities in respect to frequency management. However, certain responsibilities for departmental activities in an AF DoD AFC's area of cognizance may be delegated to the AF DoD AFC by the department concerned.

A9.5.1. Objectives:

A9.5.1.1. To provide a radio frequency coordination system and infrastructure for DoD, national and service test and training ranges and test sites. Adequate resources are required to train, staff and sustain highly qualified individuals able to perform these functions.

A9.5.1.2. To minimize harmful interference at, among and within line-of-sight of all DoD, test and training ranges and test sites possibly affected by any range owned or range-hosted EMS use.

A9.5.1.3. To ensure compliance of range and range-hosted SD systems with all national, federal, joint and departmental spectrum management regulations, policies and procedures.

A9.5.1.4. To ensure maximum utilization of the electromagnetic spectrum via cooperative use of this resource in support of DoD missions.

A9.5.1.5. To coordinate the spectrum use of all SD systems supporting RDT&E, as well as operational and training activities, at, among, and within line-of-sight of DoD, national and service test and training ranges and test sites.

A9.5.2. AFC Responsibilities:

A9.5.2.1. AF DoD AFCs are responsible for attainment of the objectives listed above.

A9.5.2.2. AF DoD AFCs are directly responsible to their respective MAJCOM for administrative purposes and to OSD/CIO and MC4EB for policy guidance.

A9.5.2.3. AF DoD AFCs shall advise each range/center commander of all affected test and training ranges and sites within the AFC's AOR of anticipated radio frequency conflicts in proposed and scheduled operations and tests. Mutual resolution of such conflicts is the responsibility of the commander's concerned. (T-2)

A9.5.2.4. AF DoD AFCs will assist the ISM, if requested, in the detection, identification and elimination of real time harmful EMI to Air Force test and training range and test site operations within their AOR.

A9.5.2.5. AF DoD AFCs are authorized to issue temporary radio silence directives, or otherwise withhold approval to radiate within their AOR, for any frequency, channel(s) or band of frequencies within the transmission capability of any interfering activity for the period of time necessary for any potential victim operation to be completed, or to protect civil or federal safety-of-life operations.

A9.5.2.6. Per Title 47, CFR, installation commanders, and all other personnel, are subject to personal fines if the spectrum use of any unauthorized activity causes interference to any civil or private sector SD system.

Attachment 10**SPECTRUM SUPPORT OF AIR FORCE SPONSORED EXERCISES WITHIN US&P****A10.1. Exercise Support**

A10.1.1. Lead times for processing an exercise package - Meeting the lead times as defined in para 5.1.4.2 is the key to successfully obtaining spectrum support for an exercise. Lead times are defined for each exercise depending on the exercise participants as described below:

A10.1.1.1. US Joint Exercises with Foreign Participants. Spectrum requirements (including US platforms) requiring FAA coordination must be submitted to the FAA 120 days prior to STARTEX. At a minimum, AFSMO requires 30 days to review the exercise package prior to submission to the FAA. Therefore a complete exercise package must be received by AFSMO no later than 150 days prior to STARTEX.

A10.1.1.2. US Only Exercise. Spectrum requirements that need FAA coordination must be submitted to the FAA 90 days prior to STARTEX at a minimum. AFSMO requires 30 days to review the package prior to submission to FAA. Therefore all exercise packages must be received by AFSMO no later than 120 days prior to STARTEX.

A10.1.1.3. Packages/components submitted after the above stated timelines will require a letter of justification/impact statement of late submission signed by the Wing Commander or equivalent.

A10.1.2. Exercise Package components. Frequency proposals: must be a complete and accurate to include: participants and platforms (US and Foreign); spectrum certifications and/or AIMS certification or recommendation letters; properly identified AOR (ARBs/MOAs/SUAs).

A10.1.2.1. Link 16 proposals and worksheet(s).

A10.1.2.2. EA requirements supporting the exercise must be identified. Note: EA requirements will be processed IAW CJCSM 3212.02 or CJCSM 3212.03 guidance.

A10.1.2.3. Stop Buzzer – identify primary and alternate stop buzzers commercial phone numbers. Note: For exercises including a GPS event(s), HQ FAA requires a single stop buzzer for the GPS event and exercise.

A10.1.2.4. Operational POC. Identify a primary and alternate POC who can answer questions pertinent to operational issues.

A10.1.2.5. Flight Schedule. Flight schedule consist of the number of aircraft, date(s), times and aircraft platforms participating only. Flight schedule consists of the total number of aircraft that will be flying at a specific time. The number of platforms in the flight schedule must reflect the maximum number of platforms participating at the operational location for the exercise. The NRM field (SFAF 341) in the proposal must match the max number of platforms operating at any given time during the exercise. To prevent OPSEC concerns, the flight schedule must not contain any classified information as well as unit identifiers or home station.

A10.1.2.6. Engagement Area Map. This map shows the geographical area where the exercise will take place. The location identified on the proposals must be contained within the area identified on the engagement area map.